Marios S. Pattichis

Image and Video Processing and Communication Lab (ivPCL)
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Education

Ph.D., Computer Engineering, The University of Texas at Austin, 1998

M.S.E., Electrical Engineering, The University of Texas at Austin, 1993

B.A., Mathematics, The University of Texas at Austin, 1991

B.Sc., Computer Sciences, (minor in EE), The University of Texas at Austin, 1991

Professional experience

6/2017-Present	Director and Graduate Advisor, Online Programs in Internet of Things and Space Systems Engineering, Department of Electrical and Computer Engineering, UNM. Space Systems Engineering is a joint program with the Department of Mechanical Engineering at UNM.
6/2017-9/2020	Associate Chair, Dept. of Electrical and Computer Engineering, UNM.
10/2019-12/2020	Fellow, Center for Collaborative Research and Community Engagement in the College of Education, University of New Mexico
7/2012-Present	Professor, Dept. of Electrical and Computer Engineering, UNM
1/2012-9/2015	Area Chair, Computer Engineering Program, Dept. of Electrical and Computer Engineering, UNM
7/2007-6/2012	Associate Professor, Dept. of Electrical and Computer Engineering, UNM
9/2007-6/2012	Associate Professor (non-voting faculty), Dept. of Radiology, UNM
9/2006-9/2007	Adjunct Assistant Professor, Dept. of Radiology, UNM
9/2000-6/2007	Assistant Professor, Dept. of ECE, UNM
9/2003-2/2005	Visiting Assistant Professor, Dept. of Computer Science, The University of Cyprus (required return to home country for US CASP (scholarship) program)
9/1999-9/2000	Research Assistant Professor, Dept. of ECE, UNM
8/1998-8/1999	Visiting Assistant Professor, Dept. of EECS, Washington State University
6/1998-7/1998	Post-Doctoral Fellow, Dept. of ECE, The University of Texas at Austin

Primary areas of active research interests

- Computer-Aided Diagnosis for using large-scale image and video datasets
- Biomedical image and video analysis and communications systems
- Explainable image representations
- Large-scale video analytics to quantify student participation in educational settings (new)
- Dynamically reconfigurable systems for image and video processing
- Research in developing, teaching, and implementing integrated mathematics and computer programming curricula for middle-school students who are predominately Latinx

Honors

2021   UNM STC Innovation Award
2019-2022 Gardner Zemke Professorship Category I: Teaching, ECE, UNM.
2019-2020 Fellow of Center for Collaborative Research and Community Engagement,
             UNM College of Education and Human Sciences
2018   UNM STC Innovation Award
2017   Founder of ClearStream Technologies, Finalist for Creative Business Cup, USA.
2017   UNM STC Innovation Award
2016   Lawton-Ellis Award, Dept. of Electrical and Computer Engineering.
2016   UNM STC Innovation Award
2015   UNM STC Innovation Award
2014   UNM STC Innovation Award
2014   AFRL Summer Faculty Fellow
2012   AFRL Summer Faculty Fellow
2010   Silver Zia Award from Santa Fe Public School System (co-recipient with ECE Department, cited for my work on teaching electronics at Larragoite Elementary School)
2006   Best paper award (co-author), *3rd IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI06)*
2006   Senior Member of IEEE
2006   UNM School of Engineering Harrison Faculty Excellence Award
2003   Recognized by Xilinx Corporation for Contributions to Undergraduate ECE Education
2003   Teacher of the Year Award, Dept. of Electrical and Computer Engineering, UNM
1991   High honors in Computer Sciences, The University of Texas at Austin
1991   Special honors in Computer Sciences, The University of Texas at Austin
1991   High honors in Mathematics, The University of Texas at Austin
1987-1991 Full Scholar of Cyprus-America Scholarship Program (CASP) to support undergraduate studies at the University of Texas at Austin (US AID program and Fulbright Commission of Cyprus).

Patents (2 under review, 10 allowed or granted, 4 licensed)

1. "Design of Single-Stage Hardware N-Sorters, Rank Order N-Filters, and the Fast Multiway Merge Sorting Networks Which They Enable," Inventors: Robert Bernard Kent and **Marios S. Pattichis**, US Patent application published on October 28th, 2020.
2. "Fast and Scalable 2D Convolutions and Cross-correlations for Processing Image Databases and Videos on CPUs," Inventors: Cesar Carranza, Daniel Llamocca, and **Marios S. Pattichis**, US Patent application published on May 27th, 2020.
3. "System and Methods for Computing 2-D Convolutions and Cross-correlations," Inventors: Cesar Carranza, Daniel Llamocca, and **Marios S. Pattichis**, US Patent 10,810,696 B2, granted Oct. 20th, 2020. Patent acknowledges NSF CNS1422031.
4. "System and methods for motion estimation in digital videos using Amplitude-Modulation Frequency-Modulation (AM-FM) Model," **Marios S. Pattichis**, P. A. Rordiguez-Valderrama, and Victor Manuel Murray Herrera, U.S. Patent 10,949,985 B2, granted on 03/16/2021.
5. "System and Methods for the Computation of the Forward and Inverse Discrete Periodic Radon Transform on CPUs and GPUs", Inventors: Cesar Carranza, Daniel Llamocca, and **Marios S. Pattichis**, US Patent allowed on 11/9/2020. Pending Patent acknowledges NSF CNS1422031.
6. "System and Methods for Joint and Adaptive Control of Rate, Quality, and Computational Complexity for Video Coding and Delivery," Inventors: **Marios S. Pattichis**, Yuebing Jiang, Cong Zong, Gangadharan Esakki, Venkatesh Jatla, and Andreas Panayides, US Patent application published on Aug. 2nd, 2018. Patent acknowledges NSF CNS1422031. Licensed to ClearStream Technologies, LLC. Patent claims allowed on 6/4/2021.

7. "System and Methods for Dynamic Management of Hardware Resources," Inventors: **Marios S. Pattichis**, Yuebing Jiang, and Daniel Llamocca, US Patent 9,542,198 B2 granted on January, 10th, 2017. Licensed to ClearStream Technologies, LLC.
8. "System And Methods For Computing Forward and Inverse Discrete Periodic Radon Transform," Inventors: Cesar Carranza, Daniel Llamocca, and **Marios S. Pattichis**, US Patent US10049469B2, granted 08/14/2018.
9. "System and methods for video image processing," Inventors: Timothy Perez, Yuebing Jiang, and **Marios S. Pattichis**, US Patent 9,451,161, granted on 9/20/2016.
10. "System and Methods for Dynamic Management of Hardware Resources," Inventors: **Marios S. Pattichis**, Yuebing Jiang, and Daniel Llamocca, U.S. Patent 9,111,059, approved on Aug. 18th, 2015. Licensed to ClearStream Technologies, LLC (2017). Also, licensed to Fluidviews, LLC (2017).
11. "System and Methods of Regularized Optimization For Matrix Factorization And Image and Video Reconstruction," Inventors: Paul Rodriguez-Valderrama, **Marios S. Pattichis**, and Victor Manuel Murray-Herrera, U.S. Patent 8,908,992 B1, granted on 12/9/2014.
12. "System and Methods of Amplitude-Modulation Frequency-Modulation (AM-FM) Demodulation for Image and Video Processing," Victor Manuel Murray Herrera, **Marios S. Pattichis**, Peter Soliz, Carla Paola Agurto Rios and Herbert T. Davis III, U.S. Patent 8,515,201 B1, approved on Aug. 20th, 2013, biomedical applications licensed to VisionQuest Biomedical, LLC.

Invention Disclosures
13. "Fast Discrete-Decision Making Algorithms Based on Optimal Computation," **Marios S. Pattichis**, invention disclosure to STC, May 14, 2013.
14. "Novel Motion Estimation Method," Inventors: Victor Manuel Murray-Herrera, Paul Rodriguez-Valderrama, and **Marios S. Pattichis**, *Provisional Patent Filed* on June 30th, 2011 (full patent application not filed).

Affiliations
- Center for Collaborative Research and Community Engagement in the College of Education, UNM (2019-2020).
- Configurable Space Microelectronics Innovation & Applications Center (COSMIAC, renamed from FPGA Mission Assurance Center (FMAC)), Board member and Co-PI (one of two Co-PIs) to the proposal that funded the Center at UNM, (2007-2012)
- UNM Center for Biomedical Engineering, General Affiliate, School of Engineering, UNM
- UNM Department of Radiology, School of Medicine (non-voting faculty member)
- UNM Junior Researcher Strategic Committee (2008)
- UNM Cancer Research and Treatment Center (CRTC) Group (2002-2008)
- Department of Computer Science, The University of Cyprus (2003-2004, 2008)
- UNM School of Medicine/School of Engineering Collaboration Group (2002)
- UNM Biomedical Physics Group (2002)
- Cyprus Institute of Neurology and Genetics (1990-2000)

Society memberships
- IEEE (senior member)
- IEEE Signal Processing Society
- IEEE Engineering in Medicine and Biology Society
- IEEE Computer Society
- IEEE SP/COM Albuquerque Chapter, Vice-President (2011-present)
- American Association of University Professors (AAUP, 1999-present)

Editorial service
- Senior Associate Editor, *IEEE Transactions On Image Processing*, October 1st, 2018 – October 1st, 2021.
- Senior Associate Editor, *IEEE Signal Processing Letters*, September 13th, 2015 – September 13th, 2018.
- Associate Editor, *IEEE Transactions on Image Processing,* October 2010-October 2014.
- Guest Editor, "Guest Editorial to Special Issue on Biomedical Monitoring Technologies," *International Journal of Monitoring and Surveillance Technologies Research* (IJMSTR), Parts 1 and 2, vol. 1, no. 4, October-December, 2013.
- Guest Editor, *Special Issue on Biomedical Informatics*, *IEEE Transactions on Information Technology in Biomedicine*, (2011).
- Guest Editor, *Special Issue on Biomedical Signal Processing and Analysis*, *Biomedical Signal Processing and Control* (Elsevier), (2011).
- Guest Editor, *Special Issue on Computational Intelligence in Medical Systems*, *IEEE Transactions on Information Technology in Biomedicine*, September 2009.
- Associate Editor, *IEEE Transactions on Industrial Informatics*, July 2009-March 2011.
- Editorial Board, *International Journal of Experimental and Computational Biomechanics* (IJECB), 2009-2011.
- Associate Editor for *Pattern Recognition* (2005-2010)

Human research certification
2009   Completed PI Human Research Certification, NIH.
2002   Completed Human Research Review Committee training course and test at UNM.

RESEARCH

Active research collaborations
- Center for Collaborative Research and Community Engagement in the College of Education, UNM
- Vascular Non-invasive Screening and Diagnostic Centre (VSNDC), London, UK
- Vascular Screening and Diagnostic Centre, Nicosia, Cyprus
- Medical Informatics Laboratory, Department of Computer Science, The University of Cyprus, Nicosia, Cyprus

Active and completed sponsored research (only UNM awarded amounts are shown)
Total external grant awards to UNM: **$15,958,773 (mostly NSF, AFRL, NIH).**
Total internal grant awards: **$206,214.**
1. *Enabling STEM Teachers' Research to Expand Latinx Learners' Authentic Experiences in Computer Programming (ESTRELLA).* Lead Principal Investigator: Sylvia Celedón-Pattichis. Co-PIs: Carlos LópezLeiva and **Marios S. Pattichis**. Amount requested: $1,499,940 from the National Science Foundation-Innovative Technology Experiences for Students and Teachers (ITEST). Duration of Project: September 1, 2020 to August 31, 2025.
2. *NSF Supplemental Funds for Broadening Participation of Latina/o Students in Engineering Using an Integrated Mathematics, Engineering and Computing Curriculum in Authentic, Out-of-School Environments.* Lead Principal Investigator: Sylvia Celedón-Pattichis. Co-PIs: Drs. Carlos LópezLeiva and **Marios S. Pattichis**. Amount: $208,048 from the National Science Foundation-Innovative Technology Experiences for Students and Teachers (ITEST) and STEM+Computing. Duration of Project: September 1, 2018 to August 31, 2021.

3. *NSF Supplemental Funds for Broadening Participation of Latina/o Students in Engineering Using an Integrated Mathematics, Engineering and Computing Curriculum in Authentic, Out-of-School Environments.* Lead Principal Investigator: Sylvia Celedón-Pattichis. Co-PIs: Drs. Carlos LópezLeiva and **Marios S. Pattichis**. Amount: $24,000 from the National Science Foundation-Innovative Technology Experiences for Students and Teachers (ITEST) and STEM+Computing. Duration of Project: September 1, 2018 to August 31, 2021.
4. *NSF EAGER: Computer-Assisted Video Analysis Methods for Understanding Underrepresented Student Participation and Learning in Collaborative Learning Environments,* $299,999, PI: **Marios S. Pattichis**. Co-PIs: Sylvia Celedón-Pattichis and Carlos LópezLeiva, NSF STEM+C, 9/1/18-8/31/21.
5. *NSF ITEST: Broadening Participation of Latina/o Students in Engineering Using an Integrated Mathematics, Engineering and Computing Curriculum in Authentic, Out-of-School Environments*, $1,419,118 (with two supplemental awards), PI: Sylvia Celedón-Pattichis. Co-PIs: **Marios S. Pattichis** and Carlos LópezLeiva, NSF ITEST, 9/1/16 – 8/31/2021.
6. *NSF CSR:Small:Dynamically Reconfigurable Architectures for Time-varying Image Constraints (DRASTIC) Based on Local Modeling and User Constraint Prediction*, $459,870, PIs: **Marios S. Pattichis** and Daniel Llamocca, NSF AWD 1422031, 10/01/14 – 10/01/17.
7. *Advancing Out-of-School Learning in Mathematics and Engineering (AOLME)*, PIs: LópezLeiva, C.A., **Pattichis, M.S.**, and Celedón-Pattichis, S., 2013 College of Education at UNM Research initiative, ~$40K and $8K matching funds from School of Engineering at UNM, June 2013 - May 2014, awarded.
8. *Cellular Elements for Ensemble Based Programmable Matter*, $34,942 (UNM portion), ***AFRL STTR*** (Grant number AF11-BT26), 05/01/2012 – 12/31/2012.
9. *Real-time Image Quality Assessment for Digital Fundus Images*, $202,893, M.S. Pattichis, ***NIH STTR Phase II sub-award to UNM*** (Grant Number 42EY018971-02A1), 9/1/11 – 8/19/13.
10. *Advancing New Mexico Science and Engineering Education Through Student and Teacher Education in Digital Audio, Image, and Video Processing*, $87,750, PIs: M.S. Pattichis, S.C. Pattichis, C. LópezLeiva, ***UNM support*** for *Post-Doctor Fellow Position*, FY12-FY13.
11. *Tier 1 Interdisciplinary Summer Research Program: Out-of-School Learning in Mathematics & Engineering,* (~$48,000), PIs: C. Lopez and M.S. Pattichis, funded from the ***UNM College of Education and the School of Engineering***, 06/01/2012 – 05/01/2013,
12. *Role-specific Laparoscopic Imaging Feasibility Study,* $22,464, PI: T. Perez, Collaborator: M.S. Pattichis (support for ECE student, Y. Jiang), ***UNM RAC,*** 03/01/2012 – 03/01/2013.
13. *Real-Time Reconfigurable Systems for Space Applications*, $2,563,577. Lead PIs: C. Christodoulou, M.S. Pattichis. **AFRL Award #FA9453-09-C-0309**, 11/24/2008-6/15/2015.
14. *FMAC Support Activity for Advanced Electronic Materials, Devices and Circuits for Space Electronics,* $5,059,324. Note that FMAC has been renamed to COSMIAC. Co-PIs: C. Christodoulou and M.S. Pattichis, **AFRL Award #FA9453-0802-0259**, 08/21/2008 – 07/31/2013.
15. *Stroke Risk Stratification Through Plaque Motion Analysis of Longitudinal Carotid Ultrasound*, ($200,000 total, $74,142 for UNM), Co-PIs: S. Barriga and M.S. Pattichis. ***NIH SBIR Phase-I, Recovery Act Limited Competition: Small Business Catalyst Awards for Accelerating Innovative Research (R43)***, 08/16/2010–08/15/2011.
16. *Diabetic Retinopathy Image Analysis*, $277,418, PI: M.S. Pattichis, ***NIH RC3 Bridge Program and NIH SBIR Phase II*** sub-awards to UNM from VisionQuest Biomedical, 7/1/2009 - 12/31/2011.
17. *Diabetic Retinopathy Image Analysis*, $29,978, PI: M.S. Pattichis, NIH sub-award to UNM from ***NIH SBIR Phase II*** awarded to VisionQuest Biomedical, 10/1/08–9/30/09.
18. *Diabetic Retinopathy Image Analysis*, $107,100, PI: M.S. Pattichis, NIH sub-award to UNM from ***NIH SBIR Phase II*** awarded to VisionQuest Biomedical, 08/19/08–08/17/09.
19. *Design, Implementation and Dissemination of Multidisciplinary online Java Digital Signal Processing (J-DSP) Software Development*, $12,000. UNM PI: M.S. Pattichis, ***NSF Phase 3 Award #0817596,*** Performance Site to NSF collaborative multi-University, multidisciplinary project,

08/01/2008-08/01/2011.

20. *Reconfigurable Parallel Computer Architectures for Space Applications*, $2.4 million. Lead PI: M.S. Pattichis, Co-PIs: C. Christodoulou and H. Pollard, **AFRL Award #FA9453-06-C-0211**, 02/01/05 – 02/28/12.
21. *Continuous-Scale Image & Video Search*, PI: M.S. Pattichis, $75,000. **DARPA seed funding,** 09/15/2007 – 05/15/2008. The funding was executed as a subcontract to the *Reconfigurable Parallel Computer Architectures for Space Applications* contract.
22. *FMAC Support Activity at the UNM*, $478,995. Lead PI: C. Christodoulou, Co-PI: M.S. Pattichis, *AFRL,* 06/01/2007-09/30/2008.
23. *Education and Research in FPGAs for Space Applications*, $59,962. Lead PI: C. Christodoulou, Co-PIs: M.S. Pattichis and H. Pollard, *AFRL*, 06/02/06-02/28/07.
24. *New Technology for Space Applications*. $50,000. Lead PI: C. Christodoulou, Co-PIs: M.S. Pattichis and H. Pollard, ATK, 10/1/05-12/30/05.
25. *Signal and Image Processing for Modeling and Simulation in Biomedical Applications,* $20,000, PI: Marios S. Pattichis, *Orion International Technologies, Inc*, 8/23/05 - 5/31/06.
26. *Spatiotemporal Video Analysis for Biomedical Imaging,* $20,000, PI: M.S. Pattichis, *Kestrel Corporation*, 8/23/04 - 5/31/05.
27. *Machine Intelligence and Simulation*, $56,873, PIs: C. Abdallah, G. Heileman, and M.S. Pattichis, *Honeywell*, 3/04/04 - 9/30/04.
28. *Signal Detection in Retinal Videos*, $20,534, PI: Marios S. Pattichis, *Kestrel Corporation*, 8/25/03 - 5/30/04.
29. *Wireless Education (WED2003): Hands-on Education Services and R&D, and ChipsNSalsa Gateway*. ~$100,000, Co-PIs: C. Abdallah, C. Christodoulou, R. Jordan, M.S. Pattichis, C. Pedregal, and L. Padilla, Hewlett Packard, 9/2003 – 8/2004.
30. *Longitudinal Chest X-ray and CT-scan Lung Nodule Detection and Analysis.* $25,000, PIs: M.S. Pattichis and D. James*, UNM Cancer Research and Treatment Center,* 9/2002 - 8/2003.
31. *Implementation and Modernization of EDK and MicroBlaze Lab Requirements*. $34,781, PI: M.S. Pattichis, Xilinx Corporation, 1/1/2003 – 12/31/2003.
32. *Laser Hardening*. $98,736, Co-PIs: C. Christodoulou and M.S. Pattichis, Ball Aerospace, 5/01/2001 - 3/06/2002.
33. *Wireless Education (WED2002): Hands-on Education Services and R&D*. $127,260, Co-PIs: C. Abdallah, C. Christodoulou, R. Jordan, and M.S. Pattichis, Hewlett Packard, 9/2002 – 8/2003.
34. *Computer Assisted Chest Radiograph Reader I & II*. $76,299, UNM PI: M.S. Pattichis, Collaborator with Kestrel Corporation, **NIH SBIR Phase-II**, 10/1/2000 - 5/31/2003.
35. *Optical Imaging Device of the Retinal Function.* $42,984, UNM PI: M.S. Pattichis, Collaborator with Kestrel Corporation, **NIH SBIR Phase-II**, 10/01/2000 - 5/31/2003.

Equipment support (total for UNM ECE: $562,864)
1. *ECE Lab support.* $13,546, Xilinx Corp support for workshops, June, 2006.
2. *ISTEC Lab support.* $239,749, Co-PIs: R. Jordan and M.S. Pattichis, Xilinx Corporation, August 2005 (http://www.unm.edu/news/Aug05Releases/05-08-10istec.htm).
3. *ECE Lab support.* $1733, Xilinx Corporation, 2004.
4. *ECE Lab support.* $400, Xilinx Corporation, 2004.
5. *ECE Lab support.* $1733, Xilinx Corporation, 2004.
6. *ECE Lab Support*. $305,703, PI: M.S. Pattichis, equipment, software, and monetary support for EECE lab development, Xilinx Corporation, 09/2000–1/15/2003.

Journal editorials (accepted or published)

J1. **Pattichis, M.S.**, Acton, S.A., and Pattichis, C.S., "Large scale video analytics for clinical decision support," *IEEE Journal of Biomedical and Health Informatics*, to appear in 2022.

J2. Celedón-Pattichis, S., LópezLeiva, C., **Pattichis, M.S.**, & Civil, M. (accepted). Introduction to the special issue on teaching and learning mathematics and computing in multilingual contexts. *Teachers College Record*, to appear in 2022.

J3. Loizou, C., Morega, M., Kyriacou, E., Pasca, S., Petroudi, S., Bamidis, P., **Pattichis, M.S.**, and Pattichis, C.S. "Guest Editorial to Special Issue on Biomedical Monitoring Technologies," *International Journal of Monitoring and Surveillance Technologies Research* (IJMSTR), Parts 1 and 2, vol. 1, no. 4, pp. October-December 2013.

J4. Pattichis, C.S., Bamidis, P.D., Christodoulou, C., Kyriakou, E., **Pattichis, M.S.**, Mitsis, G.D., and Pitris, C., "Editorial for Special Issue on Biomedical Signal Processing and Analysis," *Biomedical Signal Processing and Control*, vol. 6, no. 3, pp. 217-218, 2011.

J5. Pattichis, C.S., Schizas, C.N., E., Kyriakou, E., Fotiadis, D. I., **Pattichis, M.S.**, and Bamidis, P.D., "Guest Editorial: Introduction to the Special Issue on Citizen Centered e-Health Systems in a Global Healthcare Environment: Selected Papers from ITAB 2009," *IEEE Transactions on Information Technology in Biomedicine*, vol. 15, no. 1, pp. 3-10, January 2011, PMID: 21172757.

J6. Pattichis, C.S., Schizas, C.N., **Pattichis, M.S.**, Micheli-Tzanakou, E., Kyriakou, E., and Fotiadis, D. I., "Guest Editorial: Introduction to the Special Section on Computational Intelligence in Medical Systems," *IEEE Transactions on Information Technology in Biomedicine*, vol. 13, no. 5, pp. 667-672, September 2009.

Journal papers (published, accepted, or to appear)

J7. LópezLeiva, C. Noriega, G., Celedón-Pattichis, S., & **Pattichis, M.S.**. Bilingual Latinx students' mathematics and computer programming attitudes and experiences from students to co-facilitators. *Teachers College Record*, to appear in 2022.

J8. Celedón-Pattichis, S., Kussainova, G., LópezLeiva, C., & **Pattichis, M.S.**. "Fake it until you make it": Participation and positioning of a bilingual Latina student in mathematics and computing. *Teachers College Record*, to appear in 2022.

J9. Esakki, G., Panayides, A., Jatla, V., and **Pattichis, M. S.**, "Adaptive Video Encoding for Different Video Codecs." *IEEE Access,* vol. 9, 68720-68736, 2021.

J10. Ulloa, A., Jing, L., Good, C. W., vanMaanen, D. P., Raghunath, S., Suever, J. D., Nevius, C. D., Wehner, G. J., Hartzel, D. N., Leader, J. B., Alsaid, A., Patel, A. A., Kirchner, H. L., Pfeifer, J. M., Carry, B. J., **Pattichis, M. S.**, Haggerty, C. M., Fornwalt, B. K., Deep-learning-assisted analysis of echocardiographic videos improves predictions of all-cause mortality," *Nature BME*, volume 5, pp. 546-551, 2021 (available at https://doi.org/10.1038/s41551-020-00667-9).

J11. Kent, Robert B and **Pattichis, M.S.**, "Design, Implementation, and Analysis of High-Speed Single-Stage N-Sorters and N-Filters." *IEEE Access*, volume 9, pp. 2576-2591, December 2020.

J12. Silva, R.F., Plis, S., Adali, T., **Pattichis, M.S.**, and Calhoun, V.D., "Multidataset Independent Subspace Analysis with Application to Multimodal Fusion," *IEEE Transactions On Image Processing*, vol. 30, pp. 588-602, October 2020.

J13. Constantinou, K., Constantinou, I., Pattichis, C.S., and **Pattichis, M.S.,** "Medical Image Analysis Using AM-FM Models and Methods," *IEEE Reviews in Biomedical Engineering*, volume 14, pp. 270-289, January 2020.

J14. Panayides, A.S., **Pattichis, M.S.**, Pantziaris, M., Constantinides, A.G., and Pattichis, C.S., "The Battle of the Video Codecs in the Healthcare Domain - A Comparative Performance Evaluation Study Leveraging VVC and AV1," *IEEE Access,* volume 8, pp. 11469-11481, January 2020.

J15. Jatla, V., **Pattichis, M.S.**, and Arge, C.N., "Image Processing Methods for Coronal Hole

Segmentation, Matching, and Map Classification," *IEEE Transactions On Image Processing*, volume 29, pp. 1641-1653, October 2019.

J16. Wallace, S., Arge, C.N., **Pattichis, M.S.**, Hock-Mysliwiec, R.A., and Henney, C.J., "Estimating Total Open Heliospheric Magnetic Flux," *Solar Physics*, vol. 294, no. 2, 19 pages, 2019.

J17. Panayides, A., **Pattichis, M.S.**, Leandrou, S., Pitris, C., Constantinidou, A., and Pattichis, C.S., "Radiogenomics for Precision Medicine With A Big Data Analytics Perspective," *IEEE Journal of Biomedical and Health Informatics,* vol. 23, no. 5, pp. 2063-2079, Sept. 2019.

J18. Antoniou, Z., Panayides, A.S., Pattichis, C.S., and **Pattichis, M.S.**, "Real-Time Adaptation to Time-Varying Constraints for Medical Video Communications," *IEEE Journal of Biomedical and Health Informatics,* vol. 22, no. 4, pp. 1177-1188, July, 2018.

J19. Jiang, Y. and **Pattichis, M.S.**, "A Dynamically Reconfigurable Architecture System for Time-Varying Image Constraints (DRASTIC) for Motion JPEG," *Journal of Real-time Image Processing*, vol. 14, no. 2, pp. 395-411, 2018.

J20. Carranza, C., Llamocca, D., and **Pattichis, M.S.**, "Fast 2D Convolutions and Cross-Correlations Using Scalable Architectures," *IEEE Transactions on Image Processing*, vol. 26, no. 5, pp. 2230-2245, May 2017.

J21. Silva, R.F., Plis, S.M., Sui, J., **Pattichis, M.S.,** Adalı, T., and Calhoun, V.D., "Blind Source Separation for Unimodal and Multimodal Brain Networks: A Unifying Framework for Subspace Modeling," *IEEE Journal of Selected Topics in Signal Processing*, vol. 10, no. 7, pp. 1134-1149, October, 2016.

J22. Carranza, C., Llamocca, D., and **Pattichis, M.S.**, "Fast and Scalable Computation of the Forward and Inverse Discrete Periodic Radon Transform," *IEEE Transactions on Image Processing*, vol. 25, no. 1, pp. 119-133, Jan. 2016.

J23. Murray, V., **Pattichis, M.S.**, Llamocca, and Lyke, J., "Field Programmable Wiring Systems," invited, *Proceedings of IEEE,* special issue on *Reconfigurable Systems: Advanced Applications and Technologies,* vol. 103, no. 7, pp. 1159-1180, July 2015.

J24. Agurto, C., Yu, H., Murray, V., **Pattichis, M.S.**, Nemeh, S., Barriga, S., and Soliz, P., "A Multiscale Decomposition Approach to Detect Abnormal Vasculature in the Optic Disc," *Computer Graphics and Image Processin*g, vol. 42, pp. 137-149, July 2015.

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J26. Panayides, A.S., **Pattichis, M.S.**, Loizou, C.P., Pantziaris, M., Constantinides, A.G., and Pattichis, C.S., "An Effective Ultrasound Video Communication System Using Despeckle Filtering and HEVC," *IEEE Journal of Biomedical and Health Informatics*, vol. 19, no. 2, pp. 668-676, March 2015.

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173. **Pattichis, M.S.**, Pattichis, C.S., Christodoulou, C.I., James, D., Ketai, L., and Soliz, P., "A Screening System for the Assessment of Opacity Profusion in Chest Radiographs of Miners with Pneumoconiosis," invited in *5th IEEE Southwest Symposium on Image Analysis and Interpretation*, Santa Fe, New Mexico, pp. 130-133, Apr., 2002.

174. Pattichis, C.S., and **Pattichis, M.S.**, "Adaptive Neural Network Imaging in Medical Systems," invited in *Proc. of the 35th Asilomar Conference on Signals, Systems, and Computers*, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, vol. 1, pp. 313-317, Nov., 2001.

175. Rodriguez V., P., and **Pattichis, M.S.**, "Adaptive Sampling and Processing of Ultrasound Images," invited in *Proc. of the 35th Asilomar Conference on Signals, Systems, and Computers*, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, vol. 1, pp. 323-327, Nov., 2001.

176. Pattichis, C.S., **Pattichis, M.S.** and Micheli-Tzanakou, E., "Medical Imaging Fusion Applications: An Overview," invited in *Proc. of the 35th Asilomar Conference on Signals, Systems, and Computers*, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, vol. 2, pp. 1263-1267, Nov., 2001.

177. Pattichis, C.S., Christodoulou, C.I., **Pattichis, M.S.**, Pantziaris, M., and Nicolaides, A., "An Integrated System for the Assessment of Ultrasonic Imaging Atherosclerotic Carotid Plaques," in *Proc. 2001 IEEE Int. Conf. on Image Processing 2001*, Thessaloniki, Greece, vol. 1, pp. 325-328, Oct., 2001.

178. **Pattichis, M.S.**, Zhou, R., and Raman, B., "New Algorithms for Computing Directional Discrete Fourier Transforms," in *Proc. 2001 IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, vol. 3, pp. 322-325, Oct., 2001.

179. Ray, N., Havlicek, J., Acton, S.T. and **Pattichis, M.S.**, "Active Contour Segmentation Guided by an AM-FM Dominant Component Analysis," in *Proc. 2001 IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, vol. 1, pp. 78-81, Oct., 2001.

180. **Pattichis, M. S.**, Ramachandran, J., Wilson, M., Pattichis, C.S. and Soliz, P., " Optimal Scanning, Display, and Segmentation of the International Labor Organization (ILO) X-Ray Images Set for Pneumoconiosis," in *Proceedings of the 14th IEEE Symposium on Computer-Based Medical Systems,* Bethesda, MD, pp. 511-515, Jul., 2001.

181. Soliz, P., **Pattichis, M.S.**, Ramachandran, J., and James, D.S., "Computer-assisted diagnosis of chest radiographs for pneumoconiosis," in Proceedings of the *SPIE Medical Imaging Conference*, San Diego, California, vol. 1, pp. 667-675, Feb., 2001.

182. **Pattichis, M.S.**, Petropoulos, H., and Brooks, W.H., "MRI Brain Image Segmentation Using an AM-FM Model," invited in the 34th Asilomar Conference on Signals, Systems, and Computers, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, vol. 2, pp. 906-910, Nov., 2000.

183. Pizano, C.E., Heileman, G.L., Abdallah, C.T. and **Pattichis, M.S.**, "Are Perfect Image Watermarking Schemes Possible?," invited in the *Proc. 10th IEEE Mediterranean Electromechanical Conference (MELECON 2000)*, Limassol, Cyprus, vol. 2, pp. 669-672, May 2000.

184. **Pattichis, M.S.**, "Novel Algorithms for the Accurate, Efficient and Parallel Computation of Multidimensional, Regional Discrete Fourier Transforms," invited in the *Proc. of the 10th IEEE*

Mediterranean Electrotechnical Conference (MELECON 2000), Limassol, Cyprus, pp. 53-533 May, 2000.

185. **Pattichis, M.S.**, "Least Squares FIR Filter Design Using Frequency Domain Piecewise Polynomial Approximations," published in the proceedings of *X European SignalProcessing Conference*, Tampere, Finland, Sept. 5-8, 2000.

186. **Pattichis, M.S.**, Bovik, A.C., Havlicek, J.W., and Sidiropoulos, N.D., "On the Representation of Wideband Images Using Permutations for Lossless Coding," in Proc. of *IEEE Southwest Symposium on Image Analysis and Interpretation*, Austin, Texas, pp. 237-241, Apr., 2000.

187. **Pattichis, M.S.**, Pattichis, C.S., Avraam, M., Bovik, A.C., and Kyriakou, K., "AM-FM Texture Segmentation in Electron Microscopic Muscle Imaging," invited in *Proc. of the 1999 IEEE International Conference on Acoustics, Speech and Signal Processing,* (ICASSP), Phoenix, Arizona, vol. 4, pp. 2331-2334, Mar., 1999.

188. Sidiropoulos, N.D., **Pattichis, M.S.**, Bovik, A.C., and Havlicek, J.W., "COPERM: Transform-domain Energy Compaction by Optimal Permutation," in *Proc. of the 1998 IEEE International Conference on Acoustics, Speech and Signal Processing*, (ICASSP), Seattle, WA, vol. 6, pp. 3301-3304, 1998.

189. Lee, S., **Pattichis, M.S.**, and Bovik, A.C., "Foveated Image/Video Quality Assessment in Curvilinear Coordinates", *Int. Workshop on Very Low Bitrate Video Coding 98,* pp. 189-192, Oct. 1998.

190. Lee, S., **Pattichis, M.S.**, and Bovik, A.C., "Rate Control for Foveated MPEG/H.263 Video," in *Proc. IEEE Int. Conf. on Image Processing 98*, vol. 2, pp. 365-369, Oct., 1998.

191. **Pattichis, M.S.**, Pattichis, C.S., Avraam, M., Bovik, A.C., and Kyriakou, K. "Non-Stationary Texture Segmentation in Electron Microscopy Muscle Imaging Using an AM-FM Model," in *CD-ROM proceedings of the VIII Mediterranean Conference on Medical and Biological Engineering and Computing*, Limassol, Cyprus, Jun., 1998.

192. **Pattichis, M.S.**, Christodoulou, C., Pattichis, C.S., and Bovik, A.C., "Non-Stationary Texture Classification Using an AM-FM Model," in *Proceedings of International Conference on Neural Networks*, Houston, Texas, vol. 3, pp. 1552-1557, Jun. 1997.

193. **Pattichis, M.S.**, and A.C. Bovik, "AM-FM Expansions for Images," in *Proc. European Signal Processing Conf.*, Trieste, Italy, Sept., 1996.

194. Havlicek, J.P., **Pattichis, M.S.**, Harding, D.S., Christofides, A.C., and Bovik, A.C., "AM-FM Image Analysis Techniques," in *Proc. of the IEEE Southwest Symposium on Image Analysis, and Interpretation*, San Antonio, Texas, pp. 195-200, Apr., 1996.

195. Pattichis, C.S., **Pattichis, M.S.**, Schizas, C.N., "Wavelet Analysis of Motor Unit Action Potentials," in *Proc. of Engineering in Medicine and Biology Society, 1996. Bridging Disciplines for Biomedicine, 18th Annual International Conference of the IEEE*, vol. 4, pp. 1493-1495, 1996.

196. **Pattichis, M.S.**, and Bovik, A.C., "A Fluid Model for Texture Images," in *Proc. Workshop on Image and Multidimensional Signal Processing*, Belize City, Belize, pp. 18-19, Mar., 1996.

197. **Pattichis, M.S.**, and Bovik, A.C., "Multi-Dimensional Frequency Modulation in Texture Images," in *Proc. International Conference on Digital Signal Processing*, Limassol, Cyprus, pp. 753-758, Jun., 1995.

198. **Pattichis, M.S.**, and Bovik, A.C., "A Nonlinear Fluid Model for Describing Frequency Modulation of Image Orientations," in *Proc. IEEE Workshop on Non-Linear Signal and Image Proc.*, Neos Marmaras, Halkidiki, Greece, pp. 198-201, Jun., 1995.

199. **Pattichis, M.S.**, and Pattichis, C.S., "Fast Wavelet Transform in Motor Unit Action Potential Analysis," in *Proc. Int. Conf. of the IEEE Engineering in Medicine and Biology Society*, San Diego, California, pp. 1225-1226, Oct., 1993.

200. **Pattichis, M.S.**, and Bostick, F.X., "Fast Wavelet Transform Applications in Electromagnetics," in *Proc. of the Int. Conf. on Digital Signal Processing*, Nicosia, Cyprus, pp. 106-111, July 1993.

Refereed conference presentations:

1. LópezLeiva, C.A., & Celedón-Pattichis, S., **Pattichis, M.S.** (2021, April). Latinx middle-school students' use of translanguaging to support learning of computer programming and mathematics. In A. Pierson (Chair), *Translanguaging and disciplinary literacies*. Symposium to be presented at the annual meeting of the American Educational Research Association, Orlando, Florida.

2. Celedón-Pattichis, S., Kussainova, G., LópezLeiva, C.A., **Pattichis, M.S.**, Noriega, G. (2020, June). *"Fake it until you make it!": A case study on how language use and positioning mediated the participation in mathematics and computer programming of a Latina learner*. To be presented at the TODOS: Mathematics for All Conference, Scottsdale, Arizona. [Presentation postponed to June 2021 due to COVID-19]

3. LópezLeiva, C.A., Triana Ruiz, H., Triana Ruiz, K., Solis, J., Sandoval, A., Noriega, G., Celedón-Pattichis, S., **Pattichis, M.S.** (2020, June). *"I never thought I would reach this high": The experiences of middle school Latinx student co-facilitators teaching mathematics and computer programming*. To be presented at the TODOS: Mathematics for All Conference, Scottsdale, Arizona. [Presentation postponed to June 2021 due to COVID-19]

4. LópezLeiva, C.A., & Celedón-Pattichis, S., **Pattichis, M.S.** (2020, April). Latinx middle-school students' use of translanguaging to support learning of computer programming and mathematics. In A. Pierson (Chair), *Translanguaging and disciplinary literacies: Exploring and leveraging translanguaging across disciplinary contexts*. To be presented at the annual meeting of the American Educational Research Association, San Francisco, California. [Accepted but conference cancelled due to COVID-19]

5. LópezLeiva, C.A., Celedón-Pattichis, S., & **Pattichis, M.S.** (2019, June). "Nurturing leadership and identities in mathematics and computer programming through assigned responsibility in AOLME". Poster presented at the *NSF/ITEST PI & Evaluator Summit 2019*, Alexandria, Virginia.

6. **Pattichis, M.S.**, LópezLeiva, C.A., & Celedón-Pattichis, S. (2019, June). "Computer-assisted video analysis methods for understanding underrepresented student participation and learning in collaborative learning environments". Poster presented at the *NSF/ITEST PI & Evaluator Summit 2019*, Alexandria, Virginia.

7. Celedón-Pattichis, S., LópezLeiva, C. A., & **Pattichis, M.S.**, (2019, April). "In-between languages and in-between roles: Latinx middle-school students using translanguaging to enact computer-programming teaching identities". In L. A. Maldonado (Chair), Translanguaging and mathematics: Recognizing and capitalizing on the brilliance of bilingual children. Presented at the annual meeting of the *American Educational Research Association*, Toronto, Canada.

8. Panayides, A.S., Pattichis, C.S., Loizou, C.P., **Pattichis, M.S.**, and M. Pantziaris, M., "The Battle of Codecs in the Healthcare Domain: VVC or AV1?," presented in *41st Annual Conference of the IEEE Engineering in Medicine and Biology Society,* 2019.

9. Celedón-Pattichis, S., LópezLeiva, C. A., & **Pattichis, M. S.** (2018, June). "Broadening the participation of Latinx students in learning mathematics and computer programming: Affordances and challenges". Presented at the annual meeting of the *Discovery Research PreK-12 and STEM + C PI Meeting*, Washington, D.C.

10. Panayides, A., **Pattichis, M.**, and Pattichis, C., "Quantitative Imaging for Precision Medicine," presented in *IEEE Biomedical and Health Informatics,* 2018.

11. Celedón-Pattichis, S., LópezLeiva, C. A., Barraza, M., Vennard, L., Lecea Yanguas, J. A., **Pattichis, M. S.**, & Cavazos DeLa Rocha, I. L., Noriega, G., Kussainova, G., Demir, I., & Triana Ruiz, H. (2018, March). "Bilingual middle school students learning to code with their teachers: Affordances and challenges". Presented at the annual meeting of the *National Association for Bilingual Education*, Albuquerque, New Mexico.

12. Celedón-Pattichis, S., LópezLeiva, C. A., & **Pattichis, M. S.** (2017, Feb). *Teaching and learning number systems: Bilingual students accessing high quality STEM practices*. Accepted, National Association of Bilingual Education, Dallas, Texas.

13. LópezLeiva, C. A., & **Pattichis, M. S.**, & Celedón-Pattichis, S. (2016, July). "Integrating mathematics, engineering, and technology through mathematics modeling and video representations," Presented at the *International Congress on Mathematics Education*, Hamburg, Germany.

14. DeMarco, S., Arge, C.N., **Pattichis, M.S.**, Hock, R., and Henney, C.J., "Methods for estimating total open heliospheric magnetic flux," *2014 American Geological Union Fall Meeting,* San Francisco, Dec., 2014.

15. **Pattichis, M.S.,** Hock, R., Henney, C., Arge, C., DeMarch, S., Delgado, A.P., Darsey, C., and Jatla, V., "Identifying Coronal Holes: Can we learn any lessons from Computer Aided Diagnosis?," invited presentation, *2014 Solar Heliospheric & Interplanetary Environment* (*SHINE),* Telluride, Colorado, June 2014.

16. Celedón-Pattichis, S., LópezLeiva, C. A., **Pattichis, M.S.**, & Llamocca, D., "At first it was very hard, then it was fun": Conjecturing a learning trajectory for underrepresented middle school students in mathematics and engineering," In K. Gomez (Chair), *Creating contexts of pedagogical and curricular support for non-English background students in mathematics and science*. Paper presented at the annual meeting of the American Educational Research Association, Philadelphia, Pennsylvania, *2014 American Educational Research Association (AERA)*, April 2014.

17. LópezLeiva, C. A., Celedón-Pattichis, S., **Pattichis, M.S.**, & Llamocca, D., "Image representation in a middle school afterschool program**,"** *4th International Realistic Mathematics Education Conference*, Boulder, Colorado, 2013.

18. LópezLeiva, C., Celedón-Pattichis, S., **Pattichis, M.S.**, & Llamocca, D., "Successes and challenges of supporting interactive learning in a mathematics and engineering afterschool program for middle school students," *Annual meeting of the American Educational Research Association*, San Francisco, California, April, 2013.

19. Celedón-Pattichis, S., LópezLeiva, C. A., **Pattichis, M. S.**, & Llamocca, D., "Advancing out-of-school learning in mathematics and engineering," In J. Aguirre (Chair), Learning to do math inside and outside of school—fostering productive mathematical practices and identity development for Latin@ youth, *Scientific Research Symposium*, *Annual meeting of the Society for the Advancement of Chicanos and Native Americans in the Sciences*, San Antonio, Texas, October, 2013.

20. LópezLeiva, C., & **Pattichis, M. S.**, "With our feet on the ground": Affordances and challenges of developing an integrated STEM approach for Latina/o middle school students. In S. Celedón-Pattichis (Chair), Making our voices heard: Negotiating the promises and challenges of STEM education for historically underrepresented youth. Scientific Research Symposium presented at the annual meeting of the *Society for the Advancement of Chicanos and Native Americans in the Sciences*, Seattle, Washington, October, 2012.

21. Murray, V., Llamocca, D., Yuebing, J., Lyke, J., **Pattichis, M.S.**, Achramowicz, S., and Keith A., "Adaptive Wiring Panels using Cell-based Architectures: A First Approach," *Reconfigurable Systems Workshop*, Albuquerque, New Mexico, 2010.

22. Murillo S, Zamora G., Barriga S., Nemeth S., Crammer R., Edwards A., Bauman W., Soliz P., **Pattichis M.**, "Low-Cost Super Resolution Retinal Imaging with Embedded Denoising: Quantitative and Qualitative Assessment of Reconstructed Images from a Scanning Laser Ophthalmoscope," in the *2010 Meeting for Research in Vision and Ophthalmology*, ARVO 2010, *Investigative Opthalmology and Visual Sciences*, Abstract number 1803.

23. Barriga, E.S., Murray, V., Agurto, C., **Pattichis, M.S.**, Russel, S.R., and Soliz, P., "Automatic Computer-Based Grading for Age Related Maculopathy," in the *2010 Meeting for Research in Vision and Ophthalmology*, ARVO 2010, *Investigative Opthalmology and Visual Sciences*, Abstract number 1793.

24. Agurto, C., Murray, V., Barriga, E.S., **Pattichis, M.S.**, Baumann, W., and Soliz, P., "Automatic Classification of Diabetic Retinopathy Photographs Using AM-FM," in the *2010 Meeting for Research in Vision and Ophthalmology*, ARVO 2010, Investigative Opthalmology and Visual Sciences, Abstract number 1795.

25. Rodriguez, P., Murray, V., and **Pattichis, M.S.**, "A Basis Pursuit Approach for Multi-Scale AM-FM Reconstructions," *SIAM Conference on Imaging Science*, Chicago, Illinois, April, 2010.

26. Murray, V. and **Pattichis, M.S.**, "Adaptive Wiring Manifold," ReSpace/MAPLD Conference, Albuquerque, 2010.

27. Davis, H.T., Heileman, G., **Pattichis, M.S.**, Murillo, S., Barriga, E.S. and Soliz, P., "Real-time image quality feedback for fundus camera photography," in the *2009 Meeting of the Association for Research in Vision and Ophthalmology*, ARVO 2009.

28. Agurto, C., **Pattichis, M.S.**, Murillo, S., Murray, V., Abramoff, M.D., Russell, S.R., Barriga, E.S., Davis, H., Soliz, P., "Detection of Structures in the Retina Using AM-FM for Diabetic Retinopathy Classification," in the *2009 Meeting of the Association for Research in Vision and Ophthalmology*, ARVO 2009.

29. Barriga, E.S., Russell, S.R., **Pattichis, M.S.**, Murray, V., Murillo, S., Davis, H., Abramoff, M.D. and Soliz, P., "Relationship Between Visual Features and Analytically Derived Features in Non-Exudated AMD Phenotypes: Closing the Semantic Gap," in the *2009 Meeting of the Association for Research in Vision and Ophthalmology*, ARVO 2009.

30. Kief, C., Suddarth, S., Christodoulou, C., **Pattichis, M.S.**, Pollard, H.E., "Educational Activities for the FPGA Mission Assurance Center," in *Proc. 2008 ASEE Gulf-Southwest Annual Conference,* UNM, Albuquerque, New Mexico, March 26-28, 2008.

31. Cacoullos, T. and **Pattichis, M.S.**, "Pneumoconiosis Revisited: Classifiers Viewed via ROC Curves and Logic Functions," in *Proc. of International Conference of Statistical Models for Biomedical and Technical Systems* (*Biostat 2006*), Limassol, Cyprus, May, 2006.

32. **Pattichis, M.S.**, "AM-FM Analysis of Medical Images," invited in Los Alamos National Laboratory Workshop on Image Analysis and Understanding Data from Scientific Experiments, Los Alamos, NM, December 2-6, 2002.

33. Yu, H., **Pattichis, M.S.**, and Goens, M.B., "3-D Object Reconstruction using Tracking of Freehand Ultrasound," invited in Los Alamos National Laboratory Workshop on Image Analysis and Understanding Data from Scientific Experiments, Los Alamos, NM, December 2-6, 2002.

34. Cai, S. and **Pattichis, M.S.**, "Tumor Growth Image Analysis," invited in Los Alamos National Laboratory Workshop on Image Analysis and Understanding Data from Scientific Experiments, Los Alamos, NM, December 2-6, 2002.

35. Rodriguez, P. V. and **Pattichis, M.S.**, "Fast Computation of Multidimensional Discrete Fourier Transforms on Modern Single Instruction Multiple Data (SIMD) Architectures," invited in Los Alamos National Laboratory Workshop on Image Analysis and Understanding Data from Scientific Experiments, Los Alamos, NM, December 2-6, 2002.

36. Kyriacou, K., Schnorrenberg, F., Schizas, C.N., **Pattichis, M.S.**, Pattichis, C.S., *A Modular Neural Network System for the Analysis of Immunostained Nuclei in Histopathological Sections,* XIV Congress of the International Society of Diagnostic Quantitative Pathology, Oviedo (Spain), September 26-29, 2001.

37. Pattichis, C., Schizas, C., Dimopoulos, Y., Samaras, G., Christodoulou, C., Karaolis, M., Pantziaris, M., **Pattichis, M.S.** and Nicolaides, A., *Evaluation of the Risk of Stroke by Telemedicine,* World Congress on Medical Physics and Biomedical Engineering, Scientific Session: *WE-A201-01* Telecom, Telemetry & High Speed Data Transmission, Track: 04, Medical Informatics and Biomedical Information Technology, Chicago, USA, July 23-28, 2000.

38. Pattichis, C.S., **Pattichis, M.S.**, and Middleton, L.T., *The Wavelet Transform in MUAP Analysis,* Abstracts of Electromyography and Motor Control, The X International Congress of EMG, and Clinical Neurophysiology, Kyoto, Japan, vol. 97, no. 4, pp. S167, October 15-19, 1995.

39. Middleton, L., Pattichis, C., Petrondas, D., Souropetsis, M., Schizas, C., and **Pattichis, M.** *Numerical Pattern Recognition in the Automatic Analysis of Motor Unit Potentials: Technical Considerations*, IIIrd International Conference of Quantitative EMG, Larnaca, Cyprus, June 5-8, 1988.

40. Pattichis, C., Spanias, A., **Pattichis, M.S.**, Souropetsis, M., Petrondas, D., Schizas, C., and Middleton, L., *Linear Prediction analysis applied in EMG*, IIIrd International Conference on Quantitative EMG, Larnaca, Cyprus, June 5-8, 1988.

Technical Reports

1. Rodriguez, P., **Pattichis, M.S.** and Jordan, R., "Parallel Single Instruction Multiple Data (SIMD) FFT: Algorithm and Implementation," HPCERC2003-002, January, 2003.
2. **Pattichis, M.S.** and Zhou, R., " A Novel Directional Approach for the Scalable, Accurate and Efficient Computation of Two Dimensional Discrete Fourier Transforms," AHPCC2000-019 report, Fall 2000.
3. Pattichis, C.S. and **Pattichis, M.S.**, "Time-Scale Analysis of Motor Unit Action Potentials," Technical Report TR-97-11, Department of Computer Science, University of Cyprus, September, 1997.
4. Sidiropoulos, N.D., **Pattichis, M.S.**, Bovik, A.C., and Havlicek, J.W., "COPERM: Transform-Domain Energy Compaction by Optimal Permutation," Technical Report UT-CVIS-TR-97-002, Center for Vision and Image Sciences, The University of Texas at Austin, July, 1997.

Selected News Articles

1. "The Battle of the video Codecs in healthcare," Panayides, A.S., **Pattichis, M.S.**, and Pattichis, C.S.. Special Theme on Digital Health (ERCIM News No. 118), 2019.
2. "Featured Engineer: Interview with Dr. Pattichis." EE Web. Website: https://www.eeweb.com/spotlight/interview-with-dr.-marios-pattichis. Published on June 13th, 2016. Accessed July 20, 2016.

Select Workshops

1. LópezLeiva, Carlos, Pattichis, M.S., Celedón-Pattichis, and the AOLME team, "Exploring the Basics of Python Programming for Middle School Classrooms," New Mexico Computer Science Summit, October 17th, 2020. The workshop was presented to NM middle-school teachers interested in teaching CS.
2. M.S. Pattichis, "Hands on Workshop on Deep Learning, July 23rd and 24th, 9am to 2pm, Research Center on Interactive Media, Smart Systems, and Emerging Technologies (European Union RISE Center), Nicosia, Cyprus, 2019.

Selected invited talks (not including UNM talks or conference paper presentations)

1. S. Celedón-Pattichis, C. LópezLeiva, and M.S. Pattichis, "Interdisciplinary Collaborations Forum in Particular to National Science Foundation Projects," UNM College of Education, Research Brown Bag, Dec. 2nd, 2017.
2. S. Celedón-Pattichis, C. LópezLeiva, and M.S. Pattichis, "Advancing Out-of-School Learning in Mathematics and Engineering (AOLME): Lessons Learned and Future Work," UNM College of Education, Research Brown Bag, Dec. 9th, 2016.
3. M.S. Pattichis, "DRASTIC: Dynamic and fast architectures and algorithms for Image and Video Processing and Communications," September 16th, UNM ECE graduate seminar, 2016.
4. M.S. Pattichis, "DRASTIC: Dynamic and fast architectures and algorithms for Image and Video Processing and Communications," Sensor, Signal & Information Processing (SenSIP) Center, Ira A. Fulton School of Engineering, Arizona State University, May 11th, 2016.
5. M.S. Pattichis, "Multi-scale AM-FM Models with Applications in Medical Imaging," Kios Research Center for Intelligent Systems and Networks, The University of Cyprus, July 16th, 2015.
6. M.S. Pattichis, "DRASTIC: Dynamically Reconfigurable Architecture Systems for Time-varying Image Constraints," Universidad de Ingeniería y Tecnología (UTEC), Lima, Peru, September 9th, 2015.

7. M.S. Pattichis, "DRASTIC: Dynamically Reconfigurable Architecture Systems for Time-varying Image Constraints," Imperial College, London, England, October 31st, 2014.
8. M.S. Pattichis, "DRASTIC: Dynamically Reconfigurable Architecture Systems for Time-varying Image Constraints," Department of Computer Science, The University of Cyprus, October 23rd, 2014.
9. M.S. Pattichis, "DRASTIC: Dynamically Reconfigurable Architecture Systems for Time-varying Image Constraints," UNM STC Technology Social, October 10th, 2014.
10. M.S. Pattichis, "DRASTIC: Dynamically Reconfigurable Architecture Systems for Time-varying Image Constraints," IEEE EMBS/MRN 10th monthly talk, MRN, September 16th, 2014.
11. M.S. Pattichis, "Dynamically Reconfigurable Architectures for Time-Varying Image Constraints (DRASTIC)," Sensor, Signal & Information Processing (SenSIP) Center, Distinguished Lecturer Seminar Series, Ira A. Fulton School of Engineering, Arizona State University, Jan. 22, 2014.
12. M.S. Pattichis, "A Survey of Methods in Digital Image and Video Analysis," October 18th, AFRL, Albuquerque, NM, 2011.
13. M.S. Pattichis, "The UNM ECE Graduate Program," Pontificia Universidad Catolica del Peru, June 17th, 2010.
14. M.S. Pattichis, "Wireless Ultrasound Video Transmission and Analysis For Stroke Assessment," Pontificia Universidad Catolica del Peru, June 16th, 2010.
15. M.S. Pattichis, "Dynamically Reconfigurable Systems," Pontificia Universidad Catolica del Peru, June 15th, 2010.
16. M.S. Pattichis, "New Multidimensional AM-FM Signals and Systems with Applications in Biomedical Image Processing", Arizona State University, January 5th, 2010.
17. M.S. Pattichis, "*Building and Analyzing Electronic Circuits for Elementary School Children,*" Larragoite Elementary School, Santa Fe, New Mexico, August 24th, 2009.
18. M.S. Pattichis, "*Dynamically Reconfigurable Systems for Image and Video Processing*," presented for the Next Generation of Space Electronics Program, Air Force Research Laboratory, Albuquerque, New Mexico, August 11th, 2009.
19. M.S. Pattichis, "*Diagnostically Driven Image Processing for Emerging Software and Hardware Systems*," presented at the Center for Nonlinear Studies, Los Alamos National Lab, June 4th, 2009.
20. M.S. Pattichis, "*Dynamically Reconfigurable Systems for Signal, Image and Video Processing*," Xilinx Corp., Albuquerque, New Mexico, November 7th, 2008.
21. M.S. Pattichis, "*An Introduction to AM-FM Methods*," Department of Ophthalmogy and Visual Sciences, University of Iowa, September 10th, 2008.
22. M.S. Pattichis, "*Intelligent Image Processing*," Summer School on Intelligent Systems, European Thematic Network for Doctoral Education in Computing, Nicosia, Cyprus, July 6th 2007.
23. M.S. Pattichis, "*Atherosclerotic Plaque Motion Analysis from Ultrasound Videos: Can we predict rupture?,*" presented at the Center for Nonlinear Studies, Los Alamos National Lab, June 19th, 2006.
24. M.S. Pattichis, "*AM-FM models with applications in medical image analysis*," presented by the Dept of Electrical and Computer Engineering, the Dept. of Biomedical Engineering, and the Center for Perceptual Studies at the University of Texas at Austin, December 19th, 2005.
25. M.S. Pattichis, "*AM-FM models with applications in medical image processing,*" Oct. 13th, 2005, presented in the Data driven modeling and analysis speaker series, Los Alamos National Lab.

TEACHING

Courses (23 courses, 13 courses at UNM)
Taught at The University of New Mexico, Dept. of ECE, (since September 1999):
- ECE 203: Circuit Analysis I (UG)
- ECE 213: Circuit Analysis II (UG)

- ECE 231: Intermediate Programming and Engineering Problem Solving (UG)
- ECE 238L: Computer Logic Design (UG regular and internet offerings)
- ECE 314: Signals and Communications (UG)
- ECE 338L: Intermediate Logic Design (UG)
- ECE 506: Optimization Theory (GRAD, also offered online synchronous)
- ECE 510: Medical Imaging **(created new GRAD course)**
- ECE 533: Digital Image Processing (GRAD, also offered online synchronous)
- ECE 539: Digital Signal Processing I (GRAD)
- ECE 516: Computer Vision (GRAD, also offered online synchronous)
- ECE 551: Independent Study: Special Section for Accelerated Online Programs and Online Students Focused on Machine Learning Projects **(created new GRAD online course)**
- ECE 633: Advanced Topics in Image Processing **(created new GRAD course, also offered online synchronous)**

Taught at the University of Cyprus, Dept. of CS, (Sep 2003-Dec 2004, Oct 2008):
- EPL 445 Digital Image Processing (UG)
- EPL 033 An Introduction to Programming in C for Engineers (UG)
- EPL 121 Digital Systems (UG)
- EPL 231 Data Structures and Algorithms (UG)
- EPL 607 Visual Computing (GRAD)

Taught at Washington State University, Dept. of EECS, (September 1998 – August 1999):
- EE 304 An Introduction to Electrical Engineering (UG Circuits I)
- EE 321 Circuits II (UG)
- EE 314 Microprocessor Systems (UG)
- CptS 445 Digital Image and Video Processing (UG)
- CptS 251 Programming in C (UG)

Middle-school Mathematics and Computing Curriculum Development (funded by NSF)
LópezLeiva, C. A., **Pattichis, M. S.**, & Celedón-Pattichis, S. (2016-2020). *Level 1 for Spring Implementation: Video and Image Processing Using Python and the Raspberry Pi*. Advancing Out-of-School Learning in Mathematics and Engineering (AOLME) Project. University of New Mexico, Albuquerque, New Mexico.
LópezLeiva, C. A., **Pattichis, M. S.**, & Celedón-Pattichis, S. (2016-2020). *Level 2 for Summer Implementation: Object Oriented Programming and Robotics Using Python and the Raspberry Pi*. Advancing Out-of-School Learning in Mathematics and Engineering (AOLME) Project. University of New Mexico, Albuquerque, New Mexico.
LópezLeiva, C. A., **Pattichis, M. S.**, & Celedón-Pattichis, S. (2016-2019). *Nivel 1 para Implementación en la Primavera: Procesamiento de Videos e Imágenes con el Uso de Python y el Raspberry Pi*. Proyecto de Aprendizaje Extraescolar en Matemáticas e Ingeniería (AEMI). Universidad de Nuevo México, Albuquerque, Nuevo México.
LópezLeiva, C. A., **Pattichis, M. S.**, & Celedón-Pattichis, S. (2016-2019). *Nivel 2 para Implementación en el Verano: Programación Orientada a Objetos y Robótica con el Uso de Python y el Raspberry Pi*. Proyecto de Aprendizaje Extraescolar en Matemáticas e Ingeniería (AEMI). Universidad de Nuevo México, Albuquerque, Nuevo México.

Ph.D. graduates (Advisor)

1. Antonio Gomez, "Speaker Diarization and Identification from Single-Channel Classroom Audio Recording Using Virtual Microphones," Ph.D. Dissertation, Spring 2022. He is currently with Sandia National Labs.

2. Gangadharan Esakki, "Adaptive Encoding for Constrained Video Delivery in HEVC, VP9, AV1 and VVC Compression Standards and Adaptation to Video Content," Ph.D. Dissertation, Summer 2020. He is currently with the video compression group at Intel.

3. Alvaro Emilio Ulloa Cerna, "Large Scale Electronic Health Record Data and Echocardiography Video Analysis for Mortality Risk Prediction," Ph.D. Dissertation, Summer 2019 (**with distinction**). He is currently a Math and Computational Scientist at Geisinger.

4. Victor M. Stone, "Frequency Domain Decomposition of Digital Video Containing Multiple Moving Objects," Ph.D. Dissertation, Fall 2018.

5. Cesar Carranza, "Fast and Scalable Architectures and Algorithms for the Computation of the Forward and Inverse Discrete Periodic Radon Transform with Applications to 2D Convolutions and Cross-Correlations," May 2016 (**with distinction**). He is currently an **Associate Professor** with Pontificia Universidad Catolica del Peru.

6. Yuebing Jiang, "Dynamically Reconfigurable Architectures and Systems for Time-varying Image Constraints (DRASTIC) for Image and Video Compression," May 2014 (**with distinction**). He is currently with Apple.

7. John Colby Hoffman, "A Dynamically Reconfigurable Parallel Processing Framework with Application to High-Performance Video Processing," Spring 2013. He is currently a **System Architect** with Raytheon.

8. Carla Agurto, "Detection and Classification of Diabetic Retinopathy Pathologies in Fundus Images," Fall 2012. She is currently a **Research Scientist** with IBM.

9. Daniel Llamocca, "Dynamically Reconfigurable Management of Energy, Performance, and Accuracy Applied to Digital Signal, Image, and Video Processing Applications," Spring 2012. He was a **Post-Doc** with the College of Education, UNM. He is currently an **Associate Professor** at Oakland University.

10. Sergio Murillo, "Global Optimization Methods for Full-Reference and No-Reference Motion Estimation With Applications to Atherosclerotic Plaque Motion and Strain Imaging," Spring 2010. He is currently a **Research Engineer** with Vision Systems at Gentex Corporation. He was a **Research Assistant Professor** associated with the Department of ECE at UNM.

11. Oliver Jeromin, "Optimal Spectral Reconstructions from Deterministic and Stochastic Sampling Geometries using Compressive Sensing and Spectral Statistical Models," Summer 2009. He has been with Sandia National Laboratories and Gentex Corporation. He is currently **ADAS and Self-Driving Technical Specialist with Faraday Future**.

12. Victor Murray, "Multidimensional AM-FM Models with Applications," December 2008. He is currently a **Professor** and **Ex-Department Chair** of the Department of Electrical and Computer Engineering at Universidad de Ingenieria y Tecnologia, Lima, Peru. He is also **Research Associate Professor** with the Department of ECE at UNM and **Visiting Scholar, SEAS, Harvard University.**

13. Janakiramanan Ramachandran, "Image Analysis of Wood Core Using Instantaneous Wavelength and Frequency Modulation," December 2008. He is currently a **Senior Data Scientist** with Apple.

14. Alonzo Vera, "A Dynamic Arithmetic Architecture: Precision, Power and Performance Considerations," May 2008. He is currently the **President at IDEAS Engineering & Technology**. He is also a **Research Assistant Professor** at UNM working at COSMIAC.

15. Hongang Yu. "A 3-D Multi-View Freehand Ultrasound Reconstruction System Using Volumetric Registration and Geometric Level Set Segmentation," December 2006. She held a 50% lecturer appointment with ECE and a 50% research scientist appointment with the Keck-UNM Small-Animal

Imaging Lab at the School of Medicine at the UNM. She was a **Research Scientist** with VisionQuest Biomedical.

16. Eduardo S. Barriga, "Spatiotemporal Independent Component Analysis with Applications to Optical Imaging," Ph.D. in Electrical Engineering, August 2006. He was a lead software engineer, with Orion International Technologies. He was then appointed as a Research Assistant Professor with ECE at UNM. He is currently the **President of VisionQuest -Rx, Inc.** He received the **2013 Outstanding Young Engineer by the IEEE Albuquerque Section**.

17. Paul Rodriguez V. "Fast and Accurate AM-FM Demodulation with Applications," Ph.D. in Electrical Engineering, August 2005. He was hired by the Mathematical Modeling and Analysis group at the Los Alamos National Laboratory. He is now a **Professor** with the Pontificia Universidad Catolica del Peru. He received the **2014 National Award for Scientific Production – Concytec (Peru) & Elsevier.** He served as an **Associate Editor** of IEEE Transactions on Image Processing.

18. Jeff Kern, "Multispectral Image Registration using Mutual Information," Ph.D. (with distinction) in Electrical Engineering, May 2003. Jeff was a distinguished member of the technical staff at Sandia National Laboratories. He also served as a part-time instructor with the Department of ECE at UNM.

M.Sc. graduates with thesis option (advisor)

1. Sravani Teeparthi, "Long-term Video Object Detection and Tracking in Collaborative Learning Environments," Fall 2021 (with distinction). She was funded through NSF.

2. Phuong Tran, "Fast Video-based Face Recognition in Collaborative Learning Environments," Fall 2021. She was funded through NSF.

3. Mario Javier Esparza Perez, "Spanish and English Phoneme Recognition by Training on Simulated Classroom Audio Recordings of Collaborative Learning Environments," Summer 2021. He received partial funding from NSF.

4. Luis Sanchez Tapia, "The Importance of the Instantaneous Phase in Detecting Faces with Convolutional Neural Networks," Summer 2019. He is currently pursuing a Ph.D. with me at UNM.

5. Callie Darsie, "Hand Movement Detection in Collaborative Learning Environment Videos," Summer 2018. She is currently with Sandia National Laboratory.

6. Abigail Ruth Jacoby, "Context-Sensitive Human Activity Classification in Video Utilizing Object Recognition and Motion Estimation," Spring 2018. She is currently a Software Engineer at Numerica Corporation.

7. Wenjing Shi, "Human Attention Detection Using AM-FM Representations," Fall 2016. She is currently pursuing a Ph.D. at UNM.

8. Cody Wilson Eilar, "Distributed and Scalable Video Analysis Architecture for Human Activity Recognition Using Cloud Services," Fall, 2016. He is currently with Sandia National Laboratory.

9. Venkatesh Jatla, "Automatic Segmentation of Coronal Holes in Solar Images and Solar Prediction Map Classification," Fall, 2016. He is currently pursuing a Ph.D. at UNM.

10. Cong Zong, "Joint Control of Quality, Complexity, and Rate for HEVC Intra Mode," Summer, 2016. He is currently working at Dolby. He was funded through NSF.

11. Cebastian Westrom, "Representing Digital Images as Surfaces Using a Differential Geometric Model," May 2015. He is currently working for Honeywell in Albuquerque, NM.

12. Gangadharan Esakki, "Dynamic Switching of GOP Configurations in High Efficiency Video Coding (HEVC) Using Relational Databases for Multi-objective Optimization," Summer 2014. He is currently working towards his Ph.D. at UNM.

13. Cherish A. Franco, "Lesson Plan and Workbook for Introducing Python Game Programming to Support the Advancing Out-of-School Learning in Mathematics and Engineering (AOLME) Project," M.Sc. Thesis in Computer Engineering, Dec. 2013. She is currently with AFRL.

14. Alvaro Ulloa, "Am-fm analysis of structural and functional magnetic resonance images," M.Sc. Thesis, Electrical and Computer Engineering, May 2013. He is currently working towards his Ph.D.

at UNM. **His M.Sc. Thesis in Statistics, related to current ivPCL research, received the Lee Award for the best 2016 student presentation, awarded by the Albuquerque chapter of the American Statistical Association.**

15. Paul E. Essenmacher, "A Real-Time, Reconfigurable System for Energy, Error-Resilient, and Scalable Lossless ECG Coding," M.Sc. Thesis in Computer Engineering, August 2011, UNM. He is currently with Sandia National Laboratories.

16. Colby Hoffman, "High-Speed Dynamic Partial Reconfiguration for Field Programmable Gate Arrays," M.Sc. Thesis in Computer Engineering, August 2009, UNM. He was with Xilinx Corporation. He is now with Raytheon. **His M.Sc. Thesis was nominated for the Xilinx Ross Freeman Award for Technical Innovation.**

17. Andrew Mihalik, "Optimal Digital Filter Design for Dispersed Signal Equalization," M.Sc. in Electrical Engineering, August, 2007. He is now with Sandia National Laboratories.

18. Benjamin Mar, "SIMD Pipelined Processor Implemented on an FPGA," M.Sc. in Electrical Engineering, August, 2007. He is now with Sandia National Laboratories. **Awarded the 2011 American Indian Science and Engineering Society (AISES) Most Promising Engineer or Scientist Award.**

19. Craig Kief, "XUP-UNM Educational Platform-Large Scale Prototyping Platform," M.Sc. in Electrical Engineering, May 2006. He is now **Deputy Director of the Configurable Space Microelectronics Innovation & Applications Center (COSMIAC)** at UNM.

20. Steve M. Drescher Jr., "Feature Extraction for Improved Efficacy and Precision of a Robust and Automatic Image Registration Method," M.Sc. in Electrical Engineering, August 2005. He is with Sandia National Laboratories.

21. Oliver Jeromin, "Variogram Methods for Texture Classification and Segmentation," M.Sc. in Electrical Engineering, August 2005. He continued for a Ph.D.

22. Rob Warrick, "Multisensor Multitarget Tracking Detected from Noisy Images with a Cumulative Track Score Method for Real time Applications," M.Sc. (**with distinction**) in Electrical Engineering, May 2005. He is with Sandia National Laboratories.

23. Harini Muralidharan. "Lossless Image Compression and Nodule Detection in Chest Radiographs," M.Sc. in Electrical Engineering, August 2003.

24. Janakiramanan Ramachandran, "Hierarchical Lung Image Segmentation," M.Sc. in Electrical Engineering (Computer Engineering), May 2003. He is currently a **Senior Research Scientist** at Aureon, New York, NY.

25. Balaji Raman, "Image Processing Algorithm Analysis for the Intel Pentium-III Architecture," M.Sc. in Electrical Engineering (Computer Engineering), December 2001. He is now with GE healthcare.

M.Sc. graduates with report option (advisor)

1. Patrick Lopez, "Emotion Recognition in Digital Videos," Class Report, ECE, Summer 2019. He is currently at Sandia National Labs.

2. Mark Louie, "A comparison of video activity recognition methods," Class Report, ECE, Summer 2019. He is currently at Sandia National Labs.

3. Akash Patel, "A review of methods for video activity recognition," Class Report, ECE, Summer 2019. He is currently at Sandia National Labs.

4. Jaclynn, J. Stubbs, "Fast Image Classification using Compressively Sensed Images," M.Sc. Report, ECE, Spring 2017. She is currently with Sandia National Labs.

5. Jorge Ramos Moukel, "Bibes: An Open Source Live Search of Publications in Javascript," M.Sc. Report, ECE, Fall 2016. He is currently at Apple.

6. Nishmitha Naveenchandra Kajekar, "Tutorial on Partial Reconfiguration of Image Processing Blocks using Vivado and SDK," M.Sc. Report, ECE, Spring 2016. She has been with LitePoint, Mangalore Robautonics Private Limited.

7. J. Pierre, "Monocular Visual Odometry for Mobile Robot Vision Estimation," M.Sc. Report, ECE, Fall 2015. He is currently with AFRL.
2. G. Sandine, "Image Classification with the Flat Norm," Summer 2015. He is currently working for a non-profit company associated with LANL.
3. H. Pavuluri, "Classification of Motion of Carotid Bifurcation Plaques," Spring 2015.
4. A. Delgado, "Selecting Solar Models by Matching Coronal Holes," Spring 2015. He is currently with NIST in Maryland.
5. H. Nasrabadi, "Measurement of Motion of Carotid Bifurcation Plaques," Dec. 2014. He is currently working towards a Ph.D. at UNM.
6. P. Ortiz, "A Scalable, Low, Power Implementation of the Chirp-Z Transform in an FPGA for Real-time Image Formation," M.Sc. report in ECE, May 2014. He is currently with Sandia National Lab.
7. Y. Jiang, "Dynamically Reconfigurable DCT Architectures Based on Bitrate, Power, and Image Quality Considerations," M.Sc. report in ECE, UNM, Dec. 2013.
8. C. Carranza, "GPU Acceleration for Multiscale AM-FM Decompositions for Diabetic Retinopathy Screening," M.Sc. report in ECE, UNM, Dec. 2012.
9. Kirk Bennett, "Diabetic Retinopathy Image Analysis," M.Sc. report in ECE, UNM, May 2012.

Current student supervision (advisor)
Ph.D. students
1. Venkatesh Jatla, "Long-term Human Video Activity Quantification in Collaborative Learning Environments", UNM (ECE post-proposal). Venkatesh Jatla is an assistant director of ivPCL.
2. Wenjing Shi, "Long-term Human Video Activity Quantification using Multiple Representations in Collaborative Learning Environments," (ECE post-proposal).
3. Antonio Gomez, "Speaker Detection and Identification in Noisy Environments", Ph.D. in ECE, UNM, (ECE post-proposal).
4. Robert Bernard Kent, "Automatic Generation of Optimal Sorting Hardware", UNM (ECE pre-qualifying exam).
5. Luis Sanchez Tapia, "Automatic Spanish and English Transcription from Educational Videos," UNM (ECE post-qualifying exam).
6. Cong Zong, "Low-bandwidth Classroom Video Compression," UNM (ECE pre-qualifying exam).
7. Kevin Fotso, "AM-FM Analysis Methods for Multiple Sclerosis," UNM (Biomedical Engineering, post qualifying exam).

M.Sc. students pursuing a Thesis option
1. Jeff Love, "Drone video image analysis".
2. Ugesh Egala, "Screen Video Image Analysis".

Undergraduate Students (class projects, see separate for senior design)
1. "A WebApp to Support Digital Video Database Anaylsis," ECE 435 project, Fall 2015.
2. "Solar Image Analysis WebApp Redesign," ECE 435 project, Fall 2015.
3. Jared Morris, "Solar WebApp", Summer 2015 (supported by NSF STEP).

Undergraduate Students (honors project)
1. Rebecca E. Kreitinger, "ECE Honors Project: Cell Growth Identification," Spring 2018.

Undergraduate Students (senior design teams)
1. Cong Nguyen and Ahmed Elsawey, "Speaker Identification," Spring and Fall 2021.

2. Richard Briggs and Ivan Sean Trujillo, "Comparison of Deep Neural Networks for Audio-Visual Emotion Recognition in Collaborative Learning Environments," Fall 2020 and Spring 2021.
3. Edwin Rodriguez and Jaesic Charles Olguin "Comparison of Deep Neural Networks for Audio Speech Recognition," Spring and Fall 2020.
4. Rebecca E. Kreitinger, "Classification of Talking in Video through Feature Detection and Optical Flow," Fall 2018.
8. Sara Walton, Rachel Marianne Fulcher, Miguel Esteban Lujan, Edward Ireland-Jones, "Collaborative video annotation and video analysis," 2018-2019.
6. Md Moshiul Azam, Matthew Foust, "A WebApp for Collaborative Solar Image Analysis: Extending CARINA," 2015-2016.
7. Abby Jacoby and Alexander Kaberlein, "A WebApp to Support Digital Video Database Annotation," 2015-2016.
8. Patrick Michael Lopez, Connor Ryan Dolan, Edward Sadzewicz, Cody Wayne Shell, and Jaclynn Javonna Wakley, "Collaborative Solar Image Annotation," 2014-2015.
9. Robert Lear, Dominic Quintana, and Shujie Chen, "Solar Imaging," 2013-2014.
10. Stephen Sanchez, John Montoya, and Kasseun Wodajo, "Solar Image Analysis," 2012-2013.

Undergraduate Student Mentoring
- NSF Step program mentor, 2015-2017.

Undergraduate Students (AOLME Project, Spring 2017)
1. Elsa Janeth Martinez, LLSS.
2. Cesar Ornelas, ECE.
3. Kushal Patel, ECE.
4. Kelly Rael, ECE.
5. Windy Stephanie Slater, ECE.
6. Anthony Williams Rivera, ECE.
7. Scott Tarkul, HSC.
8. Irma Cavazos DeLaRocha, ECE.

Undergraduate Students (AOLME Project, Summer 2017)
1. Andres Alan Canedo-Zarazua, CS.
2. Irma Cavazos DeLaRocha, ECE.
3. Jacob Giese, ECE.
4. Rachel Fulcher, ECE.
5. Ronak Shah, Arch.
6. Mario Esparza Perez, ECE.
7. Nikita Purohit, Arch.
8. Scott Tarkul, HSC.

Undergraduate Students (AOLME Project, Fall 2017)
1. Windy Stephanie Slater, ECE.
2. Jacob Giese, ECE.

Graduate Students (AOLME Project, Summer 2017)

1. Alan Canedo-Zarazua, ECE.

2. Krithika Saravanan, CS.

Teachers (AOLME Project, 2017-2019)

1. Cheyenne Kolody (WMS)

2. Laura J. Vennard (WMS)

3. Margarita Barraza (PMS)

4. Liset Trigo (PMS)

Research faculty funded

1. Andreas Panagidis, Research Assistant Professor, 10/01/14 – 10/01/17 (NSF DRASTIC).

2. D. Llamocca, Post-Doc, Department of Language, Literacy and Social Studies, Jan. 2012 – Jul. 2013.

3. V. Murray, Research Assistant Professor, UNM ECE, Jan. 2009 – Feb. 2012.

4. S. Barriga, Research Assistant Professor, UNM ECE.

5. H. Yu, Research Assistant Professor, UNM ECE.

6. C. Kief, Deputy Director, Configurable Space Microsystems Innovations & Applications Center, UNM, ECE Research Staff, 08/21/2008 - 07/31/2013 (AFRL FMAC grant).

7. A. Vera, ECE Research Assistant Professor, Jan. 2011 - .07/31/2013 (AFRL FMAC grant).

SERVICE

ADMINISTRATIVE EXPERIENCE

- o **Director of Online Programs, June 2017 - Present:**
  - o Led the creation of interdisciplinary (with Mechanical Engineering) online M.Sc. degree in Electrical Engineering with concentration in Space Systems Engineering. Supervised teaching assignments, course creation, schedule, budget, and advisor to all online students.
  - o Led the creation of online M.Sc. degree in Computer Engineering with concentration in Internet of Things. Supervised teaching assignments, course creation, schedule, budget, and advisor to all online students.
  - o Led the support of faculty to transition to online teaching during the pandemic.
  - o Led online student recruitment efforts by organizing recruiting sessions for undergraduate ECE students and setting up one-to-one meetings with both domestic and international students interested in our graduate programs.
  - o Grew online programs from 0 to 50+ in three years.
- o **Associate Chair, Electrical and Computer Engineering, June 2017 – August 2020:**
  - o Director of Online Programs (see above).
  - o Developed websites for all ECE graduate programs for online recruitment.
  - o Faculty mentor to Assistant Professors.
  - o Coordinator for all course assignments. In-charge of faculty teaching assignments, student teaching assistantships, graders, and delivery of online synchronous courses.
  - o Led redesign of undergraduate curriculum to require additional labs. Implemented additional labs for programming courses (ECE 131L and ECE 231L), and participated in

the redesign of Signals and Systems to add lab component (ECE 314L), Intro to ECE (ECE 101), and EM (ECE 360).
- o Led the re-organization of graduate research areas.
- o Supporting faculty hires and acting chair (when needed).

Area Chair, Computer Engineering, January 2012-August 2015, September 2016 – June 2017
- o Organized Ph.D. qualifying exam for Computer Engineering group.
- o Course assignments for Computer Engineering group.
- o Coordinated faculty hires for Computer Engineering group.

UNM service
- Associate Chair, Electrical and Computer Engineering, June 2017 – September, 2020.
- Online programs representative in graduate committee (2017 – Present)
- Computer Engineering representative in graduate committee (2011-2015, 2017 - Present)
- Computer engineering representative in undergraduate committee (2005-2013, 2017-2020)
- UNM IT Committee, 2016 – 2019.
- Dean's committee to explore the development of bioengineering CS program in SOE (2014-2015).
- P&T Committee, 2013-2014.
- Head, Faculty search committee, 2013.
- Developed the embedded systems and DSP lab (funded by Xilinx in 2003, converted to research lab for ongoing research in reconfigurable computing)
- Developed and maintained state of the art logic design lab for ECE 238 Computer Logic Design Course (used in several workshops by Xilinx, 2000 - present)
- Developed state of the art advanced logic design lab for ECE 338 Intermediate Logic Design (used for Xilinx workshops in Summer 2006, Fall 2006)
- Undergraduate ad-hoc committee for electrical engineering, participation in re-defining the undergraduate electrical engineering degree at UNM, (2005).
- Supported general ECE lab with Xilinx software donations (2000-2008)
- Computer engineering and signals and systems undergraduate committees co-chairman, helped in curriculum design for Signals and Systems and Computer Engineering, worked on course content for: (i) ECE 238 Computer Logic Design course (to include VHDL material), (ii) ECE 314 Signals and Systems (renamed from Signals and Communications) and (iii) the proper introduction of Matlab into the programming courses, served 2000-2003.
- Organized ECE department presentations for East San Jose Elementary and Washington Middle School, May 2001.

Other UNM professional activities
- UNM medical physics group (2020-Present)
- UNM medical imaging group (2010-2011)
- UNM graduate committee proposal for Ph.D. qualifying exam (2010-2012)
- UNM ECE publicity committee (2010-2011)
- UNM ECE promotion and tenure committee (2009-2013)
- UNM junior researcher strategic committee (2008)
- UNM ECE library liaison for ECE (2006–2015)

- Computer Usage Committee (CUC) for ECE (2005–2006)
- UNM health sciences summit on health care, UNM SUB, December 5th, 2005.
- UNM CIRT, helped coordinate UNM Departments bring *Mathematica* to UNM (2008).
- Participated in meetings for defining and organizing Biomedical Physics graduate program (2002-2003).

Conference service
- **Elected and serving as a board member** for *Asilomar Conference on Signals, Systems, and Computers,* (2014-2016, 2017-2019, 2020-2022).
- Session Chair: Signal, Image, and Video Processing Education, *Asilomar Conference on Signals, Systems, and Computers,* 2021.
- Session Chair: Face and Gesture, *The 19th International Conference on Computer Analysis of Images and Patterns* (CAIP), 2021.
- Industrial panelist, "Developing industrial Methods for Large-scale Video Analysis: Some Lessons Learned," *The 19th International Conference on Computer Analysis of Images and Patterns* (CAIP), 2021.
- "Tutorial: Large Scale Video Analytics," M.S. Pattichis and A. Panayides, *The 19th International Conference on Computer Analysis of Images and Patterns* (CAIP), 2021.
- Technical Program Committee Member, *The 19th International Conference on Computer Analysis of Images and Patterns* (CAIP), 2021.
- Reviewer for *IEEE EMBC 2021.*
- *General Co-Chair*, *2020 IEEE Southwest Symposium on Image Analysis and Interpretation,* (Sponsored by the *IEEE Computer Society*), 2020.
- Session Chair: Special Session on Education, *2020 IEEE Southwest Symposium on Image Analysis and Interpretation,* (Sponsored by the *IEEE Computer Society*), 2020.
- Session Chair: *MP.P4: Linear and Non-linear Filtering I*, *IEEE International Conference on Image Processing*, 2018.
- **Technical Co-Chair,** *2018 IEEE Southwest Symposium of Image Analysis and Interpretation*
- Reviewer for *IEEE BHI 2018, IEEE EMBC 2017, 2018, National Council of Teachers of Mathematics* (NCTM) 2017, *IEEE ICASSP 2017.*
- **Technical program committee chair** for area *H. Speech, Image and Video Processing*, *Asilomar Conference on Signals, Systems, and Computers*, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, Nov. 1st – Nov. 4th, (Sponsored by the IEEE Signal Processing Society), Organized several sessions in this area, 2009 and 2016.
- Session Chair, *Big Data Analytics for Image and Video Processing, 2016 Asilomar Conference on Signals, Systems, and Computers.*
- Session Chair, *Speech and Image Analysis, 2016 Asilomar Conference on Signals, Systems, and Computers.*
- Webmaster, technical program committee, session chair, *2014, 2016, 2018, 2020 IEEE Southwest Symposium of Image Analysis and Interpretation*
- Electronic media chair, *Asilomar Conference on Signals, Systems, and Computers,* (2014-2021)
- Reviewer for *MEDICON 2016, MELECON 2016, SSIAI 2016, 2018, 2020, IEEE EMBC 2015, CAIP 2015, VISAPP 2016, IEEE BHI 2014, IEEE SSIAI 2014, IEEE BIBE 2014, IEEE HIC-POST 2014, IEEE EMBC 2014*.
- Session chair, *Image Analysis, 2014 Asilomar Conference on Signals, Systems, and Computers*
- Electronic Media Chair, *2013-2017, Asilomar Conference on Signals, Systems, and Computers.*

- Session chair, *Image Analysis and Processing, 2013 Asilomar Conference on Signals, Systems, and Computers.*
- Session chair, *High Efficiency Video Coding (HEVC), 2013 Asilomar Conference on Signals, Systems, and Computers.*
- Reviewer, *6th International IEEE EMBS Conference on Neural Engineering*, 2013.
- Session chair, *Shape and Image Analysis, IEEE ICIP*, 2012.
- Session chair, *Image and Video Coding*, Asilomar 2012.
- Local arrangements chair, technical program committee, session chair, *2012 IEEE Southwest Symposium on Image Analysis and Interpretation*
- Reviewer for *IEEE EMBC 2011, 2013, IEEE BIBE 2012, IEEE ICIP 2007, 2008, 2009, 2010, 2011, 2013, EUSIPCO 2012*.
- Poster session co-chair, *Respace/MAPLD* 2010.
- Local arrangements chair, technical program committee, sessions chair, *2010 IEEE Southwest Symposium on Image Analysis and Interpretation*
- International program committee, *The 10th IEEE International Conference on Information Technology and Applications in Biomedicine*, ITAB 2010, Corfu, Greece.
- Technical program committee for *4th International Symposium on Communications, Control and Signal Processing*, (*IEEE Signal Processing Society* sponsored), 2010.
- Technical co-chair, Biomedical Imaging and Image Processing track, *The International Special Topic Conference on Information Technology in Biomedicine*, (IEEE EMBS sponsored), 2009.
- Referee, *31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2009
- Reviewer, *2009 IEEE International Symposium on Biomedical Imaging*.
- ***General Chair***, *2008 IEEE Southwest Symposium on Image Analysis and Interpretation,* (Sponsored by the *IEEE Computer Society Technical Committee on Computational Medicine*), 2008.
- Technical program Co-chair for *Cyprus Workshop on Signal Processing and Informatics,* 2008-2012.
- Technical Program Committee member, *IEEE International Conference on Systems, Man and Cybernetics*, 2006.
- **Technical program committee chair** for *D. Biomedical Signal and Image Processing, Fortieth Annual Asilomar Conference on Signals, Systems, and Computers*, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, Oct. 29 – Nov. 1, (Sponsored by the IEEE Signal Processing Society), 2006. Organized several sessions in this area.
- Session chair for *Image Acquisition, Rendering, and Visualization, 2006 IEEE Southwest Symposium on Image Analysis and Interpretation.*
- Technical program committee, *2006 IEEE Southwest Symposium on Image Analysis and Interpretation.*
- Publications chair, *2006 IEEE Southwest Symposium on Image Analysis and Interpretation*, 2006.
- Technical program committee member, *IEEE International Conference on Systems, Man and Cybernetics*, 2005.
- Technical program committee member, *IEEE International Conference on Image Processing*, 2005.
- Technical program committee member, *2004 IEEE Southwest Symposium on Image Analysis and Interpretation*, 2004.

- Reviewer, *IEEE International Conference on Image Processing*, 2004.
- Session chair for *TA2: Wavelets, Transforms, & Filterbanks*, *2004 IEEE Southwest Symposium on Image Analysis and Interpretation,* 2004.
- Publicity chair, *2004 IEEE Southwest Symposium on Image Analysis and Interpretation*, 2004.
- Reviewer, *IEEE International Conference on Image Processing*, 2003.
- Chair for *Biomedical Signal and Image Processing* session, for the *45th IEEE Midwest Symposium on Circuits and Systems*, Tulsa, Oklahoma, August 4-7, 2002.
- Chair for *Image Analysis II* session, for the *5th IEEE Southwest Symposium on Image Analysis and Interpretation*, Santa Fe, New Mexico, April 7-9, 2002.
- Local arrangements chair for the *5th IEEE Southwest Symposium on Image Analysis and Interpretation*, Santa Fe, New Mexico, April 7-9, 2002.
- Chair for special session on *Adaptive Techniques in Image Processing*, 35th Asilomar Conference on Signals, Systems, and Computers, Asilomar Hotel and Conference Grounds, Pacific Grove, CA, November, 2001.
- Technical program committee member and session chair for Image and Multidimensional Image Processing, the *10th IEEE Mediterranean Electrotechnical Conference (MELECON 2000)*, Limassol, Cyprus, pp. 53-533 May 2000.

Journal reviewer service
- Reviewer for *IEEE Access* (2018, 2020).
- Reviewer for *EURASIP Journal on Advances in Signal Processing* (2018).
- Reviewer for *Biomedical Signal Processing and Control*, 2015, 2016, 2017.
- Reviewer for *Pattern Recognition* (2012, 2014, 2015, 2016, 2017)
- Reviewer for *IEEE Signal Processing Letters,* 2016.
- Reviewer for *IET Image Processing*, 2016.
- Reviewer for *Journal of Signal Processing Systems*, 2015.
- Reviewer for *IEEE Transactions on Multimedia*, 2015, 2016.
- Reviewer for *Electronics,* 2016.
- Reviewer for *Journal of Real-time Image Processing* (2008, 2009, 2013, 2014, 2016)
- Reviewer for *EURASIP Journal on Wireless Communications, and Networking*, 2015.
- Reviewer for *IEEE TVLSI*, 2015.
- Reviewer for *IEEE TBME*, 2015, 2016.
- Reviewer for *IEEE Trans. on Journal of Selected Topics in Applied Earth Observations and Remote Sensing* (2015, 2016)
- Reviewer for *IEEE Transactions on Circuits and Systems for Video Technology* (2013, 2015)
- Reviewer for *Sensors* (2013, 2014, 2015)
- Reviewer for *IEEE Geoscience and Remote Sensing Letters* (2012, 2015).
- Reviewer for *Journal of Electronic Imaging* (2015)
- Reviewer for *Journal of Systems Architecture* (2015)
- Reviewer for *Applied Sciences*, 2015.
- Reviewer for *IEEE Transactions on Geosciences and Remote Sensing* (2014)
- Reviewer for *IEEE Transactions on Medical Imaging* (2012, 2014, 2017, 2018)
- Reviewer for *IEEE Journal for Biomedical and Health Informatics* (2014)
- Reviewer for *IEEE Transactions on Neural Networks and Learning Systems* (2014)
- Reviewer for *Computational and Mathematical Methods in Medicine* (2014)
- Reviewer for *Mathematical Problems in Engineering* (2014)
- Reviewer for *Medical Engineering & Physics* (2013)

- Reviewer for *Magnetic Resonance in Medicine* (2013)
- Reviewer for *NeuroImage* (2013)
- Reviewer for *DSP* (2013)
- Reviewer for *IEEE Transactions on Industrial Electronics* (2013, 2014)
- Reviewer for *IEEE Transactions on Neural Networks and Learning Systems* (2013)
- Reviewer for *VLSI* (2012)
- Reviewer for *IEEE Transactions for Pattern Analysis and Machine Intelligence* (2010)
- Reviewer for *IEEE Geoscience and Remote Sensing Letters* (2010-present)
- Reviewer for *IEEE Transactions on Industrial Informatics* (2009-2011)
- Reviewer for *International Journal of Cardiovascular Imaging* (2009).
- Reviewer for *IEEE Transactions on Information Technology in Biomedicine* (2005 – present)
- Reviewer for *Optics Express* (2005)
- Reviewer for *IEEE Transactions on Biomedical Engineering* (2005, 2011, 2013, 2014)
- Reviewer for *IEEE Signal Processing Letters* (2005)
- Reviewer for *IEEE Transactions on VLSI Systems* (2005)
- Reviewer for *IEEE Transactions on Neural Networks* (2004 - 2018)
- Reviewer for *IEEE Transactions on Multimedia* (2004)
- Reviewer for *IEEE Transactions on Signal Processing* (1996 –2013).
- Reviewer for *IEEE Transactions on Image Processing* (1996 – 2018).
- Reviewer for *Pattern Recognition* (2006-present)
- Reviewer for *Pattern Recognition Letters* (2009)
- Reviewer for *Annals of Biomedical Engineering* (2009)

Other professional service
- Canadian Institutes of Health Research (CIHR), late 2015.
- National Science Foundation Panelist (CISE), 2003, 2006, 2011, 2015, 2020.
- IEEE GlobalSip 2015, best paper award committee, 2015.
- Portugese Foundation for Science and Technology, Proposal Reviewer, 2012.
- W.M. Keck Foundation Proposal Reviewer, 2011.
- National Institutes of Health (NIH) Review Panel, 2009.
- Co-chair for *W2: Medical Image Analysis, the II Mediterranean Conference on Medical Physics: The Analog to Digital Migration of the Hospital Working Environment,* Limassol, Cyprus, April 26-30, 2004.
- Section Editor for Signal and Image Processing Methods Section for Wireless Health Systems for M-Health: Emerging Mobile Health Systems, Ed. R.H. Istepanian, S. Laxminarayan, and C.S. Pattichis, published in 2005.

Public service
- Science Fair Judge, Longfellow Elementary, Albuquerque Public Schools, 2008-2012.
- Santa Fe Public Schools Presentations, 2009, 2010.
- Career Enrichment Center Presentations, 2008, 2009.

Ph.D. dissertation committee service at UNM (not including committee chair)
1. Manish Bhattarai, "Integrating deep learning and augmented reality to enhance situational awareness in firefighting environments," Ph.D. in ECE with distinction, Fall 2020, (Chair: Prof. Manel Marinez-Ramon).

2. Ran Luo, "Advancing Elastic Solid Dynamics in Computer Graphics," Ph.D. in ECE with distinction, Spring 2020, (Chair: Prof. Yin Yang).
3. Manish Bhattarai, "Next Generation Smart and Connected Firefighter System," ECE Ph.D. proposal, Fall 2019, (Chair: Martinez-Ramon).
4. Joseph Gleason, "Software Design for Probabilistic Safety," Ph.D. proposal, Summer 2019, (Chair: Oishi).
5. Y. Zhang, "Intelligent Computational Transportation," Ph.D., Summer 2018, (Chair: Prof. Yin Yang).
6. Isaac Klickstein, Ph.D. Proposal, Mechanical Engineering, "Control of complex networks," (Chair: Prof. Francesco Sorrentino).
7. Francisco Perez Venegas, "Detection and classification of vibrating objects in SAR images," Ph.D. Proposal, ECE (Chair: Prof. B. Santhanam).
8. Claudia Garrido Martins, Ph.D. Proposal, "Assessment of Project Risks in Fast-Track Construction Projects," Civil Engineering, (Chair: Prof. S. Bogus).
9. O. Agcaoglu, "New Approaches For Estimating Hemispheric Lateralization From Resting State FMRI Data With Relationship to Age, Gender, and Mental Disorders," Ph.D. ECE (Chair: Prof. V. Calhoun), Fall 2016.
10. B. Rashid, "Approaches for Capturing Time-varying Functional Network Connectivity With Application to Normative Development and Mental Illness," Ph.D. ECE (Chair: Prof. V. Calhoun), Fall 2016.
11. H. He, "Searching Neuroimaging Biomarkers in Mental Disorders with Graph and Multimodal Fusion Analysis of Functional Connectivity," Ph.D. ECE (Chair: Prof. V. Calhoun), August 2016.
12. N. Strisciuglio, "Bio-inspired algorithms for pattern recognition in audio and image processing," University of Groningen, Fall 2016, (Chair: N. Petkov). Awarded Cum Laude predicate for being in the top 5-10% in the field.
13. D. Olmstead, "Oblique Shock Wave Effects on Impulsively Accelerated Heavy Gas Column", ME UNM (Chair: R Truman), August 2015. This dissertation was awarded distinction.
14. Y. Wei, "Dynamic Generalized Extreme Value via Particle Filters," Math, UNM (Chair: Prof. G. Huerta), June 2015.
15. E. Nava, "Usage Management Enforcement in Cloud Computing Virtual Machines," Ph.D., ECE (Chair: Prof. G. Heileman), May 2015.
16. M. R. Arbabshirani, "Functional Network Connectivity in Human Brain and Its Applications in Automatic Diagnosis of Brain Disorders," Ph.D., ECE (Chair: Prof. V. Calhoun), July, 2014.
17. E. Castro, "Application of Multiple Kernel Learning on Brain Imaging for Mental Illness characterization," Ph.D., ECE (Chair: Prof. V. Calhoun), Dec. 2013.
18. J. Chen, "Parallel Independent Component Analysis with Reference for Imaging Genetics: A Semi-blind Multivariate Approach," Ph.D. (with distinction), ECE (Chair: Prof. V. Calhoun), Dec. 2013.
19. K. Liang, "Optimization Design for Multi-Domain Optical Network Provisioning and Survivability," Ph.D. dissertation, ECE (Chair: Prof. N. Ghani), July 2013.
20. F. Gu, "Survivable Cloud Networking Services," Ph.D. dissertation, ECE (Chair: Prof. N. Ghani), June 2013.
21. R. Kalyanam, "Application of Independent Component Analysis to Magnetic Resonance Spectroscopy," Ph.D. proposal, ECE (Chair: Prof. V. Calhoun), 2012.
22. R. Silva, "Extending JICA to Directly Model Multimodal Joint Distributions," Ph.D. proposal, ECE (Chair: Prof. V. Calhoun), 2012.
23. N. Xu, "Applications of Support Vector Machines in Electromagnetic Problems," Ph.D., ECE, Spring 2011 (Chair: Prof. Christodoulou).
24. L. Xu, "Independent Component Analysis for Structural Magnetic Resonance Imaging," Ph.D., ECE, Summer 2010 (Chair: Prof. V. Calhoun).
25. Xie (Kevin) Chongyang, "Advance Reservation in Distributed Computer Networks," Ph.D., ECE, Fall 2010 (Chair: Prof. N. Ghani).

26. M. Wang, "Capacitive Micromachined Ultrasonic Transducer Arrays for Blood Flow Ultrasound Doppler and Photoacoustic Imaging Applications," Ph.D., ECE, Summer 2010, (Chair: Prof. J. Chen).
27. T. Thach, "Information Similarity Metrics in Information Security and Forensics," Ph.D., ECE, Fall 2009.
28. S. Xia, "A Conceptual Framework for Visual Data Mining with Continuous Semantic Zooming," Ph.D., ECE, Summer 2009.
29. Q. Liu, "Multi-Domain Hierarchical Routing in DWDM Networks," Ph.D., ECE, Fall 2008.
30. J. Parra, "A Reconfigurable Multiprocessor Architecture For Space Missions: The AFRL-UNM HERC," Ph.D., ECE, Spring 2008.
31. J. Ricardo Otazo Torres, "Advanced Parallel Magnetic Resonance Imaging Methods with Applications to Spectroscopic Imaging," Ph.D., ECE, Fall 2007.
32. Y. Wang, "Enhanced Intelligent Image Classification Techniques with Remote Sensing Applications," Ph.D., ECE, Summer 2004.
33. J. Liu, "Human Cardiovascular Dynamics Identification, Simulation, and Applications," Ph.D., ECE, Summer 2004.
34. W. Abd-Almageed, "Active Contours Using Density Estimation with Applications to MRI Segmentation and Target Tracking," Ph.D., ECE, Spring 2004.
35. T. Song, "Intelligent Image Processing of MRI/FMRI Images," Spring, 2004.
36. M. Mowafi, "Design and Evaluation of a New System for Collaborative Virtual Environments," Ph.D., ECE, Summer 2003.
37. J. Greenfield, "A Perceptual Study of the Effects of Localized Sound in Increasing the Human Participation in Video Conferencing and Virtual Reality Environments," Ph.D., ECE, Summer 2003.
38. W. Luo, "Characterizing the Behavior of Open Address Hash Functions," Ph.D., ECE, Summer 2003.
39. S. Ma, "A Scalable Scheduled Video Delivery Paradigm," Ph.D., ECE, Summer 2003.
40. A. Martinez, "Two-Pass, Two-Antenna Target Parametric Estimation for Interferometric Synthetic Aperture Radar," Ph.D., ECE, Summer 2002.
41. R. Zhou, "Accurate and Reliable Numerical Simulations of Combustion Phenomena Using Complex Models," Ph.D., Mathematics, Summer 2001.

M.Sc. project committee service at UNM (not including committee chair)
1. S. Decker, "A Tutorial on Convolutional Neural Networks for Facial Keypoint Detection, Image Classification using Transfer Learning, and Semantic Segmentation," Spring 2017, (Chair: Prof. R. Jordan).
1. Shiqian Shen, "Recommendation System Based on Yelp Dataset," M.Sc. Project, Fall 2016, (Chair: W. Shu).
2. Uchenna Mark Ezeobi, "Meshless Deformations Based on Shape Matching," M.Sc. Project, December 2016, (Chair: Y. Yang).
3. Athul Balan, "Leveraging LwIP TCP stack in microblaze (Spartan 6) for implementation of HELP engine," M.Sc. project, Fall 2016, (Chair: J. Plusquellic).
4. C.J. Wilhelmi, "An Autonomously Learning Robotic Platform For Humanitarian Assistance And Disaster Relief," M.Sc. project, Spring 2016, (Chair: R. Fierro).
5. B. Evans, M.Sc. project, Fall 2015, (Chair: R. Jordan).
6. K.R. Knobel, "Assessing Linear Regression for Predicting Coronal Holes," Fall 2015, (Chair: S. Krisna).
7. R. Jaiswal, "A survey on Despeckling of Synthetic Aperture Radar Images, Spring 2015, (Chair: Assoc. Prof. B. Santhanam).

8. A. J. O. Ade-Bello, "Limitations and Capabilities of the Slanted Spectrogram Analysis Tool for SAR-Based Detection of Multiple Vibrating Targets," Summer 2014, (Chair: Assoc. Prof. B. Santhanam).
9. Rashid, B., "Dynamic Connectivity States Estimated from Rest fMRI Capture Differences in Schizophrenia, Bipolar Disorder, and Healthy Controls," Spring 2014, (Chair: Prof. V. Calhoun).
10. Agcaoglu, O., "Lateralization of Resting State Brain Networks with Age and Gender Effects," Spring 2014, (Chair: Prof. V. Calhoun).
11. V. Jacob, "A Survey of Cellular Technologies and Interference Mitigation Techniques," 2012, (Chair: Assoc. Prof. B. Santhanam).
12. R. Williams, "Low Earth Orbit Ionospheric Spectrum Analyzer (LEISA)," 2012, (Chair: Assoc. Prof. N. Ghani).
13. S. Keshavmurthy, "Fault Tolerant Systems in VLSI Circuits," 2012, (Chair: Assoc. Prof. P. Zarkesh-Ha).
14. J. Hundal, "Performance Evaluation of TCP Protocol in Satellite Networks," 2012, (Chair: Assoc. Prof. N. Ghani).
15. P. Palanisamy, "Global Energy Observatory System For Understanding, Visualizing and Analyzing Global Energy," Spring 2010, (Chair: Prof. N. Ghani).

M.Sc. thesis committee service at UNM (not including committee chair)
1. Georgios Fragkos, "Artificial Intelligence Enabled Distributed Edge Computing for Internet of Things Applications," M.Sc. Thesis, ECE, graduated with distinction, Fall 2020, (Chair: Prof. Tsiropoulou).
2. Pavlos Apostolopoulos, "Demand Response Management in Smart Grid Networks: a Two-Stage Game-Theoretic Learning-Based Approach," M.Sc. Thesis, ECE, Fall 2019, (Chair: Prof. Tsiropoulou).
3. Ivonne Acosta Molina, "Integration of External Load and Machine Learning for Reactive Power Control for Distribution Feeder Simulation," M.Sc. Thesis, ECE, Fall 2019, (Chair: Prof. Martinez-Ramon).
4. Manish Bhattarai, "Algorithm for Computational Imaging on a Real-Time Hardware," M.Sc. Thesis, ECE, Fall 2017, (Chair: Prof. M. Hayat).
5. G. Parras, "A Frequency Domain Based Approach to Evaluating Manual Tracking Behavior in Parkinson's Disease," M.Sc. Thesis, ECE, Fall 2016, (Chair: Prof. M. Oishi).
6. A.S. Vaidya, "Strengthening ZYNQ7000 Device Security Using ARM TrustZone," M.Sc. Thesis, ECE, Summer 2015, (Chair: Prof. J. Plusquellic).
7. A. E. H. Samaniego, "GPGPU-Enabled Physics Based Deformed Simulation," M.Sc. Thesis, ECE, Summer 2014, (Chair: Ass. Prof. Y. Yang).
8. D. Svenkeson, "Early Assessment of Brain Injury Patient Outcome Using a Transfer Function Approach," M.Sc. Thesis, ECE, May 2014, (Chair: Ass. Prof. M. Oishi).
9. A. Linan Rodriguez, "Innovation Plaza: Improving Teaching and Learning in Engineering," M.Sc. Thesis, ECE, Dec. 2013, (Chair: Prof. R. Jordan).
10. A. Ghassemi, "Neural Processing in Criminal Psychopaths Using fMRI," M.Sc. Thesis, Fall 2012, (Chair: Prof. V. Calhoun).
11. Lei Xiao, "Edge-Aware Filters for Separable Irradiance in Global Illumination Rendering," M.Sc. Thesis, Summer 2012, (Chair: Assist. Prof. Sen).
12. J. Aarestad, "Characterizing Within-Die and Die-To-Die Delay Variation Introduced by Process Variations and SOI History Effect," M.Sc. Thesis, Spring 2011, (Chair: Assoc. Prof. J. Plusquellic).
13. I. Wilcox, "Analysis of Gradient Estimation and Quantization Effects on Optical Flow Algorithms," M.Sc. Thesis, Spring 2011, (Chair: Assoc. Prof. R. Jordan).
14. L. Martinez, "Agile Testing Methods for IC Radios," M.Sc. Thesis, Fall 2010, (Chair: Assoc. Prof. R. Jordan).

15. M. Juarez, "On the Use of Independent Component Analysis & Functional Network Connectivity Analysis: Evaluation of Two Distinct Large-Scale Psychopathology Studies," M.Sc. Thesis, Summer 2010, (Chair: Prof. V. Calhoun).
16. G. Feucht, " Design & Control of a Cell-Based Architecture for Adaptive Wiring Manifolds," M.Sc. Thesis, ECE, Spring 2010 (Chair: Prof. J. Plusquellic).
17. S. Arja, "Incorporation of Phase Changes in Functional Magnetic Resonance Imaging," M.Sc. Thesis, ECE, Fall 2009.
18. A.R. Church, "An Iterative Algorithm for Simultaneous Suppression of Multiple Narrowband Interferers in Spread Spectrum Systems," M.Sc. Thesis, ECE, Fall 2008.
19. E. Castro, "Recommender Systems Based on Collaborative Filtering," M.Sc. Thesis, ECE, Fall 2008.
20. J. Krein, "Modeling Dynamic Susceptibility Enhanced MRI for Application in Angiogenesis," M.Sc. Thesis, ECE, Summer 2007.
21. R. Peralta-Meza, "Interference and Power Control in Ad Hoc Wireless Networks," M.Sc. Thesis, ECE, Summer 2007.
22. R. L. Hospelhorn, "Implementation of Steerable Pyramids with Hexagonal Sampling," M.Sc. Thesis, CS, Fall 2006.
23. J. Farrow, "Customizable FPGA Hardware Based Sound Processing Unit," M.Sc. Thesis, ECE, Fall 2006.
24. B.G. Henderson, "A Novel Method for Extrinsic Self-Calibration of Wide-Baseline Three-Dimensional Computer Vision Systems," M.Sc., ECE, Summer 2006.
25. E. Altunok, "Fuzzy and Possibility Methods for Damage Detection in Structural Health Monitoring," M.Sc. Thesis, ECE, Summer 2006.
26. P. Davidson Jr., "Laser Extraction Using Spectral Estimation and Pulsing in Ambient Lighting Conditions," M.Sc. Thesis, ECE, Fall 2005.
27. Y. Sun, "Real-time Virtual Classrooms Based on Application Layer," M.Sc. Thesis, ECE, Fall 2005.
28. A. Franco, "Automated Classification of Concrete Components," M.Sc., ECE, Fall 2005. J. Parra, "Design and Implementation of a Hardware Platform for a Reconfigurable Vector Coprocessor," M.Sc. Thesis, ECE, Summer 2004.
29. Y. Xiao, "Development and Testing of a Graph Simulation Tool for Modeling Complex Neural Network Architectures," M.Sc. Thesis, ECE, Summer 2003.
30. D. Vargas, "Circular Sections Constant Modulus Algorithm (CS-CMA)," M.Sc. Thesis, ECE, Spring 2003.
31. H. Jerez, "The Chipsnsalsa Unified Portal-Gateway for Distributed Knowledge Objects," M.Sc. Thesis, ECE, Fall 2002.
32. Y. Ding, "Improving Detector Performance in Watermarking Systems Using RBF Neural Networks," M.Sc., ECE, M.Sc. Thesis, Summer 2002.
33. D. de Oliveira Ourique, "Image Watermarking to Improve the Information Payload and Robustness Against Noise Attacks," M.Sc. Thesis, ECE, Summer 2002.
34. D. He, "Real-time Multiplexing of Variable Bit Rate Video Streams," M.Sc. Thesis, Summer 2002.
35. M. J. Thurgood, "Derivation of a Closed Form for the Original PONS Matrix and Fast Algorithms for Generating the Original and Symmetric PONS Matrices," M.Sc. Thesis, ECE, Spring 2002.
36. Y. Yang, "The effects of invisible watermarking on Satellite Image Classification," M.Sc., ECE, Fall 2001.
37. Y. Wu, "LabView Programming for Lithographic Applications," M.Sc. Thesis, ECE, Spring 2001.
38. Z. Gao, "Autonomous Resonance Neural Networks in Autonomous Robotics," M.Sc. Thesis, ECE, Fall 2000.
39. N. Prabhu, "Practical Parallel Algorithms for Cycle Detection in Planar Partitioned Digraphs," M.Sc. Thesis, ECE, Fall 2000.
40. A. J. Matteucci, "Improved Digital Signal Processing for Hypersectral Imaging of the Ocular

Fundus," M.Sc. Thesis, ECE, Fall 2000.

41. B. Gu, "A study of Bluetooth Technology," M.Sc. Thesis, ECE, Fall 2000.
42. C.E. Pizano, "Deconstructing Digital Image Watermarking," M.Sc. Thesis, ECE, ECE, Spring 2000.