

SATHISHKUMAR SAMIAPPAN, PhD

Assistant Research Professor
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EDUCATION

Doctoral - Electrical and Computer Engineering, Mississippi State University, USA 2014

Masters - Computer Science and Engineering, Amrita University, India, 2006

Bachelors - Electronics and Communications Engineering, Bharathiar University, India, 2003

PROFESSIONAL EXPERIENCE

Mississippi State University, Department of Electrical and Computer Engineering

Assistant Research Professor – May 2018 – Current

Graduate teaching assistant – August 2013 – August 2014

Graduate teaching assistant – June 2012 – May 2013

Mississippi State University, Geosystems Research Institute

Postdoctoral associate – August 2014 to April 2018

Graduate research assistant – August 2009 to May 2012

National Data Buoy Center, Stennis Space Center, MS

Internship – May 2013 to August 2013

Amrita University, Department of Electronics and Communications Engineering

Lecturer – June 2006 to July 2009

International Institute of Information Technology, Center for Visual Information Technology, Hyderabad, India

Summer Research – May 2007 – July 2007

Amrita University, Department of Computer Science and Engineering

Graduate Assistant – September 2004 to May 2006

PUBLICATIONS

Refereed Journal Articles

- 1) **S. Samiappan**, J.P. Czarnecki, *et al* "Quantifying Damage from Wild Pigs with Small Unmanned Aerial Systems" Wiley - Wildlife Society Bulletin, January 2017
- 2) **S. Samiappan**., G. Turnage, C. McCraine, *et.al* "Post-Logging Estimation of Loblolly Pine (*Pinus Taeda*) Stump Size, Area and Population Using Imagery from a Small Unmanned Aerial System". *MDPI Drones*, 2017.
- 3) **S. Samiappan**, G. Turnage, L. Hathcock, *et.al* "Mapping of Invasive *Phragmites* (common reed) in Gulf of Mexico Coastal Wetlands using Multispectral Imagery and Unmanned Aerial Systems" *International Journal of Remote Sensing*, December 2016
- 4) **S. Samiappan**, G. Turnage, L. Hathcock, *et.al* "Using Unmanned Aerial Vehicles for High-Resolution Remote Sensing to Map Invasive *Phragmites australis* in Coastal Wetlands" *International Journal of Remote Sensing*, October 2016
- 5) **S. Samiappan**, S. Prasad, and L.M. Bruce, "Non-Uniform Random Feature Selection and Kernel Density Scoring with SVM-based Ensemble Classification for Hyperspectral Image Analysis" *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, April 2013
- 6) B. Sridhar, I. A. Sheriff, K.A.N. Kutty, and **S. Samiappan** "Comparison of Cascaded LMS-RLS, LMS and RLS Adaptive Filters in Non-Stationary Environments", *Springer Novel Algorithms and Techniques in Telecommunications and Networking*, May 2010

Refereed Journal Articles (In review)

- 7) **S. Samiappan**, C.McCraine, *et al* "Remote Sensing of Wildfire using a small Unmanned Aerial System: Post-fire Mapping, Vegetation recovery and damage analysis in Grand Bay, Mississippi/Alabama, U.S" *International Journal of Remote Sensing*
- 8) **S. Samiappan**, *et.al* "Estimating the Distribution and Abundance of Water Birds on Catfish Aquaculture Facilities Using Imagery Collected from an Unmanned Aerial System" *International Journal of Wildlife Management*

Refereed Conference Proceedings

- 9) **S. Samiappan**, L. Casagrande, and G.M.Machado *et al* "Texture classification of Very High Resolution UAS Imagery Using a Graphics Processing Unit" IEEE International Geoscience and Remote Sensing Symposium, Valencia, Spain July 2018

- 10) Turnage, G., S. Samiappan, L. Hathcock, and R. J. Moorhead. 2018. "Detection of aquatic plant species using UAS technology". *15th International Symposium on Aquatic Plants*, Queenstown, New Zealand, February 18 – 23, 2018.
- 11) L. Casagrande, G.M.Machado, **S. Samiappan** et al "Probabilistic Neural Network and Wavelet Transform for Mapping of Phragmites australis using Low Altitude Remote Sensing" *ACM SIBGRAPI - Conference on Graphics, Patterns and Images* Niteroi, Brazil, October 2017
- 12) **S. Samiappan**, G.Turnage, L.Hathcock, et al "Classifying common wetland plants using hyperspectral data to identify optimal spectral bands for species mapping using a small unmanned aerial systems- a case study" *IEEE International Geoscience and Remote Sensing Symposium*, Fort Worth TX, July 2017
- 13) Prince Czarnecki, J.M., **S. Samiappan**, L. Wasson, J.D. McCurdy, D.B. Reynolds, W.P. Williams, and R. J. Moorhead. "Applications of unmanned aerial vehicles in weed science" *11th European Conference on Precision Agriculture*. July 16-20, 2017, Edinburgh, Scotland, Cambridge University Press
- 14) **S. Samiappan**, L.Dabbiru and R.Moorhead "Fusion Of Hyperspectral And Lidar Data Using Random Feature Selection And Morphological Attribute Profiles" *8th IEEE Workshop on Hyperspectral Image and Signal Processing*, Los Angeles, CA, August 2016
- 15) **S. Samiappan** and R. J. Moorhead, "Semi-Supervised Co-Training and Active Learning Framework for Hyperspectral Image Classification" *IEEE International Geoscience and Remote Sensing Symposium*, Milan, Italy June 2015
- 16) L. Dabbiru, **S. Samiappan**, R.Nobrega, et.al "Fusion of Synthetic Aperture Radar and Hyperspectral Imagery to Detect Impacts of Oil Spill in Gulf of Mexico" *IEEE International Geoscience and Remote Sensing Symposium*, Milan, Italy June 2015
- 17) J. E. Ball, D. T. Anderson, and **S. Samiappan**, "Hyperspectral Band Selection Based on the Aggregation of Proximity Measures for Automated Target Detection", *SPIE Conference - DSS*, Baltimore, ML April 2014
- 18) **S. Samiappan**, L.M. Bruce, and H. Yao, "Support Vector Machines Classification of Fluorescence Hyperspectral Image for Detection of Aflatoxin in Corn Kernels" *IEEE Workshop on Hyperspectral Image & Signal Processing: Evolution in Remote Sensing* July 25, 2013
- 19) **S. Samiappan**, L.M. Bruce, and S Prasad, "Automated Hyperspectral Imagery Analysis via Support Vector Machines based Multi-Classifer System with Non-Uniform Random Feature Selection", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*, Vancouver, Canada. July 5, 2011
- 20) **S. Samiappan**, L.M. Bruce, and S. Prasad, "Branch and Bound based Feature Elimination for Support Vector Machine based Classification of Hyperspectral Images", *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*, Vancouver, Canada. July 5, 2011
- 21) **S. Samiappan**, S. Prasad, and L.M. Bruce, "NASA's Upcoming HypsIRI Mission - Precision Vegetation Mapping with Limited Ground Truth" *Proceedings of the IEEE Geoscience and Remote Sensing Symposium*. Honolulu, Hawaii, USA June 2010

- 22) B. Arumugam, **S. Samiappan**, and P. Manoharan, "Improved Adaptive Skip Algorithm for Video Shot Boundary Detection", *Proceedings of the IEEE International Conference on Signal Processing, Communications and Networking*, Chennai, February 5, 2007

Other Refereed Conference Presentations and Posters

- 23) McCraine, C., **S. Samiappan**, G. Turnage, L. Hathcock, H. Yao, R. Kincaid, R. Moorhead, and S. Ashby. 2018. Classifying common aquatic plants using hyperspectral data to identify optimal spectral bands for species mapping using a small unmanned aerial system – a case study. Presented at the Society of Lake Management Professionals annual conference, Baton Rouge, LA, January 22-25, 2018
- 24) **S. Samiappan**, C. McCraine, L. Hathcock, et.al "Wildfire Mapping and Damage Analysis in Grand Bay National Estuarine Research Reserve, Mississippi Using a Small Unmanned Aerial System with a Multispectral Payload" presented at 2016 The Wildlife Society annual conference, Albuquerque, NM, September 2017.
- 25) G. Turnage, **S. Samiappan**, L. Hathcock, R. Moorhead "Mapping of Phragmites australis using 5-band imagery collected from an Unmanned Aerial System" presented at 2016 *The Wildlife Society annual conference*, Raleigh, NC, October 2016.
- 26) **S. Samiappan**, A. Crain, and L. Hathcock, et.al "Identification and Estimation of Damage caused by Feral Hogs in Corn Fields using Change Detection and an Unmanned Aerial System" presented at *The Wildlife Society annual conference*, Raleigh, NC, October 2016.
- 27) P. Burr, **S. Samiappan**, and L. Hathcock, et.al "Estimating the Distribution and Abundance of Water Birds on Catfish Aquaculture Facilities Using Imagery Collected from an Unmanned Aerial System" presented at *The Wildlife Society annual conference*, Raleigh, NC, October 2016.
- 28) G. Turnage, **S. Samiappan**, and L. Hathcock, et.al "Mapping of Phragmites australis using 5-band Imagery Collected from an Unmanned Aerial System" Presented at Midsouth Aquatic Plant Management Society conference, Baton Rouge LA September 2016.
- 29) **S. Samiappan**, G. Turnage, and R. Moorhead "Identifying and Mapping Chinese Tallow Tree Using Unmanned Aerial Systems and Multispectral Imagery" Presented at Midsouth Aquatic Plant Management Society conference, Baton Rouge LA September 2016.
- 30) **S. Samiappan**, B.W Henry and R. Moorhead "Plant stand count and corn crop density assessment using texture analysis on visible imagery collected using unmanned aerial vehicles" presented at the 13th International conference on Precision Agriculture, St. Louis, MO July 2016,
- 31) **S. Samiappan** and R. Moorhead "Mapping of Phragmites Australis in Gulf Of Mexico Wetlands Using Small UAS" Presented at the Gulf of Mexico Oil Spill and Ecosystem Science conference, Tampa, FL February 2016

- 32) M. Hock, W.B. Henry, and **S. Samiappan**, *et.al* "Evaluating Texture Modelling Techniques to Determine Stand Establishment and Plant Populations in Corn". Presented at South branch American society of Agronomy, Houston TX. 2016
- 33) G.Turnage, P.Stinson and **S. Samiappan** "Mapping of Common Reed (Phragmites Australis) Using Unmanned Aerial Vehicles, Gray Level Co-Occurrence Matrix Texture Extraction, and eCognition" Presented at Midsouth Aquatic Plant Management Society conference, Mobile AL September 2015.
- 34) K. Grissom, **S. Samiappan**, R. Beets, D. Petraitis, and Z. Zhou "Improvements to the TAO web-based Data Management System", *NOAA's 38th Climate Diagnostics and Prediction Workshop* August 21, 2013

Project Reports

- 35) **S. Samiappan** "Mapping of invasive phragmites in the pearl river coastal wetlands and the results of its eradication efforts" June 2016 Geosystems Research Institute May 2015
- 36) **S. Samiappan** "Evaluation of unmanned aerial vehicles (UAV's) for estimating distribution and abundance of waterbirds on catfish aquaculture facilities. NWRC December 2015
- 37) **S. Samiappan** "Evaluation of Unmanned Aerial Vehicles (UAV's) for estimating distribution and damage of feral swine" USDA-APHIS October 2015
- 38) **S. Samiappan** "Estimation of plant stands on corn hybrids from UAS imagery using color segmentation and template matching algorithms" PrecisionHawk May 2015

Dissertation and Thesis

Doctoral Dissertation

- 39) Spectral band selection for ensemble classification of hyperspectral images with applications to agriculture and food safety

Master's Thesis

- 40) Extraction of saliency regions using human visual attention model

EXTRAMURAL RESEARCH SUPPORT

Funding sources for Graduate Research Assistantships

- 1) Lori M Bruce - PI, NGA (NURI Program), "Redundant Wavelet Transforms and Information Fusion for Robust Hyperspectral ATR" \$298,580 – Grant duration: 2010 – 2012 - Involvement: Development and implementation of hyperspectral data fusion using RWT.
- 2) Lori M Bruce – PI, NASA, "Applying NASA HypsIRI observations to precision vegetation mapping for ecological forecasting applications" \$106,415 – Grant duration: 2010 – 2011 - Involvement: Field data collection, Development, and implementation of HypsIRI data classification of aquatic species.

- 3) Lori M Bruce – PI, DHS, “Rapid Detection of Agriterrorism via Remote Sensing” – Phase II \$560,779 – Grant duration: 2008 – 2011 - Involvement: Field data collection, Development and implementation of hyperspectral feature selection and classification of levels of herbicide stress on row-crop corn.
- 4) Nagabhusan P – PI, ISRO, “Content based multimedia retrieval system” – Grant duration: 2004-2007

Funding Sources for Postdoctoral Research

- 5) Robert J Moorhead – NOAA, “Sensing Hazards with Operational Unmanned Technology for the River Forecasting Centers (SHOUT4Rivers)” Grant duration: 2014 – 2016 - Involvement: Flight planning and logistics, image preprocessing, development of texture based algorithm for mapping invasive *Phragmites australis*, and land water classification.
- 6) Robert J Moorhead, USDA APHIS, “Evaluation of changes in distribution and abundance of fish-eating birds on catfish aquaculture and possible effects of industry changes” Grant duration: 2014 – 2015 - Involvement: Flight planning and logistics, image preprocessing, development of color based segmentation and template matching algorithm for estimating and distinguishing fish-eating birds.
- 7) Robert J Moorhead, USDA APHIS, “Evaluation of unmanned aerial vehicles for estimating distribution and damage of feral swine” Grant duration: 2014 - 2016 Involvement: Flight planning and logistics, image preprocessing, development of density based classification algorithm for estimating and mapping damages caused by feral hogs on row crop corn.
- 8) Kristine Evans & Anna Linhoss, DOI, “Strategic Conservation Assessment of Gulf Coast Landscapes” Grant duration: 2017-2020

RESEARCH INTERESTS

- Remote Sensing
- Pattern Classification
- Image Processing
- Machine Learning
- Computer Vision
- Unmanned Aerial Systems

PROFESSIONAL ACTIVITIES

Manuscript Review

[Publons Profile](#)

- IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing
- IEEE Journal of Selected topics in Signal Processing
- IEEE Transactions on Cybernetics
- IEEE Transactions of Geoscience and Remote Sensing
- IEEE Access
- Taylor and Francis Geodesy and Cartography

- Taylor and Francis International Journal of Remote Sensing and Remote Sensing Letters
- ISPRS International Journal of Geo-Information
- IET Image Processing
- IETE Journal of Research
- MDPI – Sensors
- MDPI – Remote Sensing
- MDPI – International Journal of Geo-Information
- Springer – Ecology – Journal of the society of wetland scientists

Doctoral Dissertation Review

- N. Mohanandhini – Annamalai University - Doctoral Candidate in EE – May 2016
- M. Sundararajan – Annamalai University - Doctoral Candidate in EE – Jan 2017
- P. Vimala – Annamalai University - Doctoral Candidate in EE – Jan 2018

Society Activities

- Chairman, ACM Student Chapter – 2006

Society Memberships

- Member, IEEE
- Member, IEEE Computer Society
- Member, IEEE Eta Kappa Nu Honor Society
- Member, International Society of Precision Agriculture
- Member, Wildlife Society
- Life Member, IETE

COURSES TAUGHT

Taught approximately 18 sections of 9 different courses at the undergraduate levels resulting in more than 1000 students. Maintained a high level of dedication to teaching, resulting in instructor evaluation scores averaging 4.0/5.0.

Fall 2017

- ECE3413 Introduction to Electric Circuits, 203 students, undergraduate (Mississippi State University) – Two sections with ~100 students in each.

Fall 2015

- ECE3413 Introduction to Electric Circuits, 128 students, undergraduate (Mississippi State University)

Fall 2014

- ECE3443 Signals and Systems, 42 students, undergraduate (Mississippi State University) **Taught selective lectures (8 lectures)*

Summer 2012, Fall 2012, Spring 2013, Fall 2013, and Spring 2014

- ECE3714 Digital Devices and Logic Design - Laboratory, 270 students combined, undergraduate (Mississippi State University)

Fall 2009

- ECE3313 Electromagnetics I - Laboratory, 36 students, undergraduate (Mississippi State University)

Spring 2009

- EC3072 Digital Communication, 55 students, undergraduate (Amrita University)

Fall 2008

- EC5049 Adaptive Signal Processing, 55 students, undergraduate (Amrita University)
- EC3091 Analog Communications, 55 students, undergraduate (Amrita University)

Spring 2008

- EC3020 Digital Signal Processing, 55 students, undergraduate (Amrita University)
- EC5084 Digital Image Processing, 40 students, undergraduate (Amrita University)

Fall 2007

- EC5049 Adaptive Signal Processing, 55 students, undergraduate (Amrita University)
- EC3091 Analog Communications, 55 students, undergraduate (Amrita University)

Spring 2007

- EC3020 Digital Signal Processing, 52 students, undergraduate (Amrita University)
- EC3072 Digital Communication, 55 students, undergraduate (Amrita University)

Fall 2006

- EC3010 Signals and Systems, 48 students, undergraduate (Amrita University)

STUDENT MENTORING

Undergraduate Research

- Daniel McCraine, Mississippi State University – Summer, Fall 2017, Spring & Summer 2018
- Donna Jaison, Mississippi State University – Spring and Summer 2016 (Currently a graduate student at the University of Texas – Arlington)
- Preston Stinson, Honors Student in EE, Mississippi State University – 2015 (Currently a graduate student at the North Carolina State University)
- Luan Carlos da Silva Casagrande, Universidade Federal de Santa Catarina, Brazil – 2015 (Honors student currently in Senior year)
- Bharath Sridhar, Amrita University - 2010 (Currently working at Robert Bosch USA – Mooresville, NC as Embedded System Engineer)
- Akram Sheriff, Amrita University – 2010 (Currently working as a R&D staff at Aruba, a Hewlett Packard Enterprise Company)

Senior Design Teams

- Daniel McCraine, Dennison Lacomini, and Caleb Lott, "ivWatch Sensor Test Bench System" 2018 (Mississippi State University)
- Luan Carlos da Silva Casagrande, "Comparative Study of Image Texture analysis And Machine Learning Methods Forclassification of phragmites Australis using True-Color High Resolution Images" 2017 (Universidade Federal de Santa Catarina, Brazil)
- Sylvania Golla, *et.al.* "Extracting Cricket Game Summaries via Frame Clustering" 2008 (Amrita University)
- Manoj Kumar, *et.al.* "Non-Chronological Dynamic Video Abstraction using Rack Through Method" 2009 (Amrita University)
- Arunchander Kalyanasamy, *et.al.* "Video object based Content-Based Video Retrieval system" 2007 (Amrita University)
- Kaushik Prakash, *et.al.* "Resolution Enhancement of Color Video Sequences" 2007

UNIVERSITY AND COMMUNITY SERVICE

- State of Mississippi - Unmanned Aerial Systems curriculum for Career and Technical Education programs – Member of curriculum development team 2017-2018
- Evaluator – Graduate Student Research Symposium (GSRS) , Mississippi State University – Spring 2016
The GSRS is an interdisciplinary forum comprised of a series of oral and poster presentations by graduate students from across the MSU campus. The GSRS showcases the outstanding quality and diversity of graduate-level research at MSU. GSRS serves as an opportunity for graduate students to gain experience giving presentations and to receive meaningful feedback from an evaluative panel of established MSU faculty members and researchers in a conference-style venue.
- Evaluator – Honors Undergraduate Student Symposium, Mississippi State University – Summer 2015, 2016, Spring 2018
The symposium, hosted by the Shackouls Honors College at MSU is an opportunity to showcase faculty-guided student research and creative activity from diverse departments, colleges and research centers across campus. I have had my undergraduate research students presenting at the symposium and I am also actively involved as an evaluator.
- Faculty Mentor, Day One – Montgomery Leadership Program – Fall 2015, Fall 2016 and Fall 2018
Day One is a service-learning community for entering freshmen in which students take a two-credit course on leadership and apply what they learn towards 20 hours of community service in the fall semester. This is offered out of the Office of Student Leadership and Community Engagement.

A Mentor is a faculty who guides a single team of 5-7 students towards the completion of its community service project over the semester. Mentors help coordinate the efforts of the team with the needs of the community and help the team members develop their leadership skills.

- American Cancer Foundation – Volunteer – 2014
- Team Mentor, Dawg Daze, Mississippi State University – 2015 and 2016
Dawg Daze is an exciting collection of service, other activities and events held to welcome new freshmen & transfer students to Mississippi State.