Malcolm Dcosta, PhD **Curriculum Vitae**

CONTACT INFORMATION

Post-Doctoral Researcher
Computational Physiology Lab
Health and Biomedical Science Center
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INTERESTS AND QUALIFICATIONS

Statistics, Machine Learning, Data Analytics, Data Mining, Human-Computer Interaction, Computational Physiology.

EDUCATION

The University of Houston, Houston, TX, USA

Ph.D., Computer Science, 2015 GPA: 3.5

- Advisor: Professor Ioannis Pavlidis
- Area of Study: Effect of stress on critical tasks and multitasking

M.S. Thesis, Computer Science, 2011 GPA: 3.42

- Advisor: Professor Ioannis Pavlidis
- Area of Study: Lie detection using contact free physiological measurement

WORK EXPERIENCE

Computational Physiology Lab, Houston, TX, USA

Post-doctoral Researcher **Jan 2016**

- Continuing ongoing doctoral research and supervising students.

Computational Physiology Lab, Houston, TX, USA

Research Assistant / Coordinator Aug 2011 - Dec 2015

- Designing and conducting stress studies and analyzing data, developing software, supervising students, assisting in grants, proposals, demos and scientific publications.

The Methodist Hospital Research Institute, Houston, TX, USA

Graduate Research Fellow Apr 2014 - Apr 2015

- Involved in research of quantifiable methods to determine surgical expertise. Performed experiments and statistical analysis of data.

Texas Institute for Measurement, Evaluation and Statistics, Houston, TX, USA

Research Assistant / Programmer Jan 2010 - Aug 2010

- Improved and developed new algorithms to performs sparce matrix multiplication of large matrices quickly and efficiently. Implemented algorithms into a C library which served R programs through wrappers.

COMPUTER SKILLS

Programming Languages and Environments

- C, C++, C#, HTML, iOS Java, JavaScript, LaTeX, Matlab, PHP, Python, R

Software Tools

- Adobe Illustrator, Photoshop, Premier-Pro, Gnuplot, Hadoop, LabChart, Microsoft Office, SAS, Weka

Operating Systems

- Windows OS, OS X

Research Projects

University of Houston, Houston, TX, USA

Lie Detection 2009 - 2011

- DOD Funded
- Novel approach to substitute the polygraph in a Contact Free manner
- 78.8 % success in blind predictions

Intention Detection 2012 - present

- DOD Funded
- Research to determine persons intent to lie in a quick, contact free 5 minute interview

Exam Stress / Difficulty Analysis 2012 - 2014

- A longitudinal study using wearable sensors to determine students exam outcomes using physiology

Children's Reading Studies 2012 - 2014

- A study on assessing children's reading ability and difficulty using sympathetic responses

Children's Dexterity Studies 2012 - 2014

- A study on determining the role of stress in performing dexterous tasks

Numerous Sensor Validations 2012 - persent

- NSF and Toyota Funded
- Performed cross validation between numerous physiological wearable sensors and inrfared cameras

SubjectBook 2014 - persent

- An interactive web-based tool for visualizing, synchronizing, exploring, and analyzing affective studies.
  subjectbook.times.uh.edu

Ethics in Science Seminar Series 2011 - persent

- Assisted in organizing a 5 year NSF seminar series about ethics in science.
  www.uh.eu/ethicsinscience.

Texas Transportation Institute, College Station, TX, USA

Driver Distraction Studies 2013 - Present

- Toyota Funded
- Simulator and road tests to determine cognitively and emotionally overloading

The Methodist Hospital Research Institute, Houston, TX, USA

Physiological Assessment of Surgeon Expertise 2013 - 2015

- Performed formed weekly surgical training sessions where physiological variables and other data were recorded to determine when a surgeon has internalized and is comfortable with the surgical practices
- Performed similar studies with high/middle school students and found that within few weeks of training, students were able to perform equally as well as freshmen surgeons

TEACHING AS A TEACHING ASSISTANT

Ethics in Science, IDNS 6391 Graduate Level, Avg. 21 students

Fall 2015, 2014, 2013, 2012

- Selective feedback: *Great class! One of the most interesting and best classes I have taken. It really made you think and analyze ethical issues instead of just giving you things to memorize for a test*.

Advanced Science Ethics, IDNS 6397 Experimental Class - Doctoral Level, Avg. 6 students

Spring 2014, 2013, 2012

- Selective feedback: *Very good to learn exactly how to deal with data, how to analyze it in a statistical way, and also how to present it. Every Ph.D student will greatly benefit from this knowledge when writing his/her dissertation*.

Computer Organization & Assembly Programming, COSC 2410 Undergraduate Level, Approx. 70 students.

Spring 2011, 2010, 2009

- *Conducted 3 hours of lab sessions each week, including teaching and grading of homeworks and assignments.*

Computer Architecture, COSC 3330 Undergraduate Level, Approx. 70 students.

Fall 2010, 2009

- *Conducted 3 hours of lab sessions each week, including teaching and grading of homeworks and assignments. Collaboratively prepared the syllabus and exams. Participated in one on one tutoring of students outside of formal teaching responsibilities as part of a Department initiated effort to further help students*

AWARDS

Annual Ph.D. research showcase

- Won 1st place consecutively in **2012** and **2013** in the annual Ph.D. research showcase at the computer science department at the University of Houston

SCHOLARSHIPS

2015 : Doctoral Consortium, IEEE International Conference on Automatic Face and Gesture Recognition Travel Grant
2013 - 2014 : Jack & D'Ann Burke & Cecelia Eichenberg Memorial Scholarship
2011 - 2014 : Doctoral Student Tuition Fellowship (DSTF)
2010 - 2014 : Texas Public Education Grant (TPEG)

SERVICE

Positions on Program Committees

- Program committee member for IEEE International Conference on Face and Gesture Recognition 2015
- Program committee member for ACM Workshop on Multimodal Deception Detection 2015
- Reviewer for IEEE Transactions on Affective Computing
- Judge: 57th annual Science Engineering Fair of Houston (Behavioral/Social Sciences)

Refereed Journal Publications

[1] I. Semendeferi, P. Tsiamyrtzis, **M. Dcosta**, I. Pavlidis, "Connecting past with present : A mixed-methods science ethics course and its evaluation", ***Science and Engineering Ethics***, Jan 24, 2015. doi:DOI: 10.1007/s11948-015-9626-4

[2] D. Shastri, S. Taamneh, **M. Dcosta**, A. Wesley, D. Currie, I. Pavlidis, "Reading assessment supplemented with a stress measurement", ***IEEE Transactions on Affective Computing*** (under review)

[3] I. Pavlidis, **M. Dcosta**, S. Taamneh, M. Manser, T. Ferris, R. Wunderlich, P. Tsiamyrtzis, "Driving performance under cognitive, emotional, sensorimotor and mixed stressors", ***Nature - Scientific Reports*** (under review)

[4] I. Pavlidis, I. Garza, P. Tsiamyrtzis, **M. Dcosta**, J.W. Swanson, T.A. Krouskop, J. Levine, "The face of migraine and its diagnostic potential", ***Headache*** (under review)

Refereed Conference Publications

[5] S. Taamneh, **M. Dcosta**, K. Kwon and I. Pavlidis, "SubjectBook: Hypothesis-Driven Ubiquitous Visualization for Affective Studies", in *Proceedings of the 2016 ACM Conference Extended Abstracts on Human Factors in Computing Systems*, San Jose, CA, May 7-12, 2016.

[6] **M. Dcosta**, D. Shastri, P. Tsiamyrtzis and I. Pavlidis, "Turning security monitoring into a high performance and engaging task", in *Proceedings of the 2016 IEEE International Symposium on Technologies for Homeland Security*, Waltham, MA, May 10-12, 2016.

[7] P. Tsiamyrtzis, **M. Dcosta**, D. Shastri, E. Prasad and I. Pavlidis, "Delineating the Operational Envelope of Mobile and Conventional EDA Sensing on Key Body Locations", in *Proceedings of the 2016 SIGCHI Conference on Human Factors in Computing Systems (CHI)*, San Jose, CA, May 7-12, 2016.

[8] S. Taamneh, **M. Dcosta**, K. Kwon and I. Pavlidis, "Subjectbook: Web-based visualization of multimodal affective datasets residing on the cloud", in *Society for Affective Science Conference*, Chicago, IL, Mar 17-19, 2016.

[9] M. Ugur, D. Shastri, P. Tsiamyrtzis, **M. Dcosta**, A. Kalpakci, C. Sharp and I. Pavlidis, "Evaluating smartphone-based user interface designs for a 2D psychological questionnaire", in *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp 15)*, Osaka, Japan, Sep 7-11, 2015.

[10] **M. Dcosta**, D. Shastri, R. Vilalta, J.K. Burgoon and I. Pavlidis, "Perinasal indicators of deceptive behavior", in *Proceedings of the 2015 IEEE International Conference on Automatic Face and Gesture Recognition (FG2015)*, Ljubljana, Slovenia, May 4-8, 2015.

[11] **M. Dcosta**, D. Shastri, and I. Pavlidis, "Perinasal indicators of malevolence", in *Proceedings of the 2015 IEEE International Conference on Automatic Face and Gesture Recognition (FG2015)*, Ljubljana, Slovenia, May 4-8, 2015.

[12] S. Taamneh, D. Shastri, C. Currie, **M. Dcosta** and I. Pavlidis, "What sympathetic responses can tell about children's performance in reading?", in *Society for Affective Science Conference*, Oakland, California, Apr 9-11, 2015.

[13] K. Patel, H. Shah, **M. Dcosta** and D. Shastri, "Evaluating a single-channel EEG sensor for Drowsiness detection", in *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing (Ubicomp 16)*, Heidelberg, Germany, Sep 12-16, 2016. (submitted)

CONFERENCE PRESENTATIONS

[1] **M. Dcosta**, P. Tsiamyrtzis, and I. Pavlidis, "Progressive loss of proprioception wreaks havoc on dexterous manipulation", at the *5th Annual International Conference in Computational Surgery and Dual Tasking*, Bethesda, Maryland, Jan 19-21, 2015.

[2] **M. Dcosta**, D. Shastri, P.Tsiamyrtzis and I. Pavlidis, "Sympathetic loading in cognitive tasks", at the *2015 IEEE International Conference on Automatic Face and Gesture Recognition, Doctoral Consortium (FG2015)*, Ljubljana, Slovenia, May 4-8, 2015.

[3] **M. Dcosta**, D. Shastri, R. Vilalta, J.K. Burgoon and I. Pavlidis, "Perinasal indicators of deceptive behavior", at the *Proceedings of the 2015 IEEE International Conference on Automatic Face and Gesture Recognition (FG2015)*, Ljubljana, Slovenia, May 4-8, 2015. **Click for video**

[4] **M. Dcosta**, D. Shastri, P. Tsiamyrtzis and I. Pavlidis, "Turning Security Monitoring into an Engaging High Performance Task", in *Proceedings of the 2016 IEEE International Symposium on Technologies for Homeland Security*, Waltham, MA, May 10-12, 2016.

[5] **M. Dcosta**, D. Shastri, P. Tsiamyrtzis and I. Pavlidis, "Turning Security Monitoring into an Engaging High Performance Task", in *Lone Star College Student Research Conference*, Kingwood, TX, Apr 23, 2016. (Keynote Speaker)

POSTER PRESENTATIONS

[1] "The face of Migraine", at the *2013 Translational Pain Research Symposium, Gulf Coast Consortia for Quantitative Biomedical Science.*

[2] "Perinasal indicators of deceptive behavior", at the *2014 Computer Science Annual Ph.D. Research Showcase.*

[3] "Sympathetic loading in cognitive tasks", at the *11th IEEE International Conference on Automatic Face and Gesture Recognition (FG2015).*

MENTORSHIP / UNPUBLISHED RESEARCH

I have had the opportunities of mentoring 7 undergraduate students during the Summer semesters from 2011 to 2015. (Click title to see poster)

[1] **2011**, Ethan Adkinsson, Harding University, AR. *21st century security monitoring.*

[2] **2012**, Aaron J. Smith, Costal Carolina University, SC. *Using accelerometer data to indicate activity and performance during monotonous tasks.*

[3] **2013**, Jeffrey Allen, University of North Alabama, AL. *Fidgeting release gadget for stress reduction.*

[4] **2013**, Dalene Hart, Austin Peay State University, TN. *Computing stress vs. dexterous performance when proprioception is impaired in children.*

[5] **2014**, Simone Hesson, Baylor College of Medicine, TX. *The relationship between economy of motion and stress in laparoscopic surgeons during simulation training.*

[6] **2015**, Marisa Gomez, Stetson University, FL and Alex Thompson, Illinois Institute of Technology, Il. *Teenage fitness mobile application.*