Eric C. Larson

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Department of Computer Science

1. RESEARCH OVERVIEW

"The research students that I have had the privilege to advise are the reason my work has been successful. I am privileged to have been able to contribute in some small way to their success. Their dedication and commitment to their study, research, and search of new knowledge is what allows science to impact the lives of so many others."

Dr. Larson is an Associate Professor in the Department of Computer Science at SMU, with courtesy appointment in the Department of Operations Research and Engineering Management. He joined SMU in August 2013 after he received his PhD from the University of Washington. He is a member of the Darwin Deason Institute for Cyber-security, Center for Global Health, and SMU AT&T Center for Virtualization, and he is a fellow of the Hunt Institute for Engineering Humanity. His research explores the interdisciplinary relationship of machine learning and signal/image processing with the fields of security, mobile health, education, chemistry, psycho-visual psychology, human-computer interaction, and ubiquitous computing. Like most academics, he has a passion for teaching and mentoring, and views research as an ideal opportunity to instruct the next generation of computer scientists and engineers. He has positioned himself (*with plenty of help from others*) in a unique role, supporting different research applications via the integration of machine learning and ubiquitous sensing. He has become increasingly interested in sensing markers of health and context awareness using commonplace sensors. His research supports many healthcare, educational, and security initiatives by creating applications that (1) manage and diagnose chronic/infectious ailments, (2) help learners master educational topics, and (3) investigate information leakage in pervasive and mobile devices.

Dr. Larson has been published numerous papers at top journals and conferences, one textbook, and two book chapters, garnering over 4,600 citations (**H-index of 26**). He has established grant funding for numerous projects as PI and Co-PI with funding from a variety of sources including **private contracts and government agencies, in excess of $8M**.

2. EDUCATION

2013 **Ph.D. in Electrical Engineering**, University of Washington, Seattle
Area: Signal Processing and Ubiquitous Computing;
Advisor: Dr. Shwetak Patel (*MacArthur Genius Fellow, ACM Prize in Computing*)
Co-Advisor: Dr. Les Atlas (*Amazon Catalyst Fellow*)
Committee: Dr. Mari Ostendorf, Dr. Xiaofeng Ren, Dr. James Fogarty, Dr. Karen Clark
Topic: *Semi-Supervised Training for Infrastructure Mediated Sensing: Disaggregated Hot and Cold Water Sensing with Minimal Calibration*

2008 **Master of Science in Electrical Engineering**, Oklahoma State University, Stillwater
Area: Image Processing and Digital Signal Processing
Advisor: Dr. Damon Chandler
Committee: Dr. Keith Teague, Dr. Gary Yen, Dr. Qi Cheng
MS Thesis: *Predictive Image Quality: The Most Apparent Distortion*

2006 **Bachelor of Science in Electrical Engineering**, Oklahoma State University, Stillwater
Area: Communications, Signals, and Controls
Summa Cum Laude

3. PROFESSIONAL EXPERIENCE

2019-*present* **Southern Methodist University**, Dallas, TX
Associate Professor, Department of Computer Science

2013-2019 **Southern Methodist University**, Dallas, TX
Assistant Professor, Department of Computer Science and Engineering

2012-2015 **Belkin Conserve Unit,** Los Angeles, CA
Systems Consultant: Machine Learning, Cloud Architecture, Firmware Design

2012-2013 **Intel Science and Technology Center**, Seattle WA
Research Assistant

2009-2013 **University of Washington**, Electrical Engineering, Seattle, WA
Research Assistant

2010 Summer	**Intel Research**, Seattle, WA *Research Intern* with Dr. Beverly Harrison
2007-2008	**Oklahoma State University**, Stillwater, OK *Research Assistant* with Dr. Damon Chandler
2006 Summer	**Garmin International**, Olathe, Kansas *Design Engineer Intern* for Consumer Electronics
2005 Summer	**Oklahoma State University**, Stillwater, OK *Undergraduate Researcher* (REU) with Dr. Keith Teague

4. POST-DOCTORAL RESEARCHERS

Feb. 2017- Feb. 2018	**Pavel Klimovich**, *Cheminformatics tools for Ligand Fingerprinting* *Publications*: [J.07]

5. DOCTORAL STUDENTS SUPERVISED

Current	**Matthew Lee**, Topic: *Forthcoming* *Publications*: [C.41],[C.43]
Current	**Zhongjie Wu**, Thesis: *Forthcoming* *Publications*: [C.46],
Current	**Joshua Sylvester**, Topic: *Forthcoming* *Publications*: [C.41],[C.43]
Current	**Clayton Harper**, (Ph.D.) Topic: *Forthcoming* *Publications*: [C.33],[C.39]
Current	**Charles Sayre**, (Ph.D.) Topic: *Forthcoming* *Publications*: Forthcoming
Current	**Zhongdi (Ultron) Wu**, (Ph.D.) Topic: *Forthcoming* *Publications*: [C.46],
Current	**Yihao Wang**, (Ph.D.) Topic: *Forthcoming* *Publications*: [J.20], [C.46], [J.22]
Current	**Yasamin Fouzani**, *ABD* (D.E.) Topic: *CMOS-Based Rotational Spectroscopy: Massive Spectral Fingerprint Generation for Enabling Automated Molecular Detection with Machine Learning* *Publications*: Forthcoming, *Current Position*: Sr Scientific Programmer for Ops Research Modeling, FedEx
July 2021	**Raghuram Srinivas**, (Ph.D.) Topic: *CFGenNets: Collaborative Filtering Based Generative Networks.* *Publications*: [J.07], [J.18], *Current Position:* Lead Data Scientist at JPM Chase
Dec. 2020	**Xinyi Ding**, (Ph.D.) Topic: *Deep Neural Network based Student Response Modeling with Uncertainty, Multi-modality, and Attention* *Publications*: [J.06], [J.08], [J.10], [J.13], [J.14], [C.30], [C.31], [OP.09], [J.23] *Current Position:* Assistant Professor (Tenure Track) at Gongshang University, China
August 2020	**Justin (Chill) Wilson**, (Co-advised with Suku Nair), (Ph.D.) Topic: *Cognitive and Context Aware Computing: Towards a Situation-aware System with a Case Study in Aviation* *Publications*: [C.32] (*best paper*), [J.15], [J.16] *Current Position*: ACCR Research Director, Assistant Professor in Department of Computer and Cyber Sciences at United States Air Force Academy, Colorado
Dec. 2017	**Chatchai (Mark) Wangwiwattanna**, (Ph.D.) Dissertation: *RGB Image-based Pupillary Diameter Tracking with Deep Convolutional Neural Networks* *Publications*: [J.06], [C.24], [C.25], [OP.10] *Current Position*: Professor in School of Science and Technology and Associate Vice President of Information Technology at UTCC, Thailand
May 2015	**Sohail Rafiqi**, (Ph.D.) Dissertation: *PupilWare: Towards Cognitive and Context Aware Computing* *Publications*: [C.24], [C.25], *Current Position*: Analyst at Google Cloud, Specializing in Healthcare Applications

6. MASTERS' STUDENTS SUPERVISED (THESIS)

Dec. 2021 **Joshua Sylvester**, (Co-advised with Dr. Hornbach) Thesis: *Developing IoT-based Geophysical Micro-observatories Utilizing Cloud Computing*
Publications: [C.41], [C.43] *Current Position*: PhD Student with Dr. Larson

Dec. 2021 **Zhongdi (Ultron) Wu**, (Co-advised with Dr. G. Alford) Thesis: *Exploring Neural Networks for Predicting Sentinel-C Backscatter between Image Acquisitions*
Publications: [C.46], *Current Position*: PhD Student with Dr. Larson

May 2018 **Travis Siems**, Thesis: *Understanding Natural Keyboard Typing Using Convolutional Neural Networks on Mobile Sensor Data*
Publications: [J.09],[P.08], *Current Position*: Analyst at Toyota Connected

August 2016 **Spencer Kaiser**, Thesis: *Open Spirometry: portable, low-cost spirometry utilizing 3D-printed vortex whistles and smartphones*
Publications: [B.03], [C.27],[P.07], *Current Position*: Analyst at American Airlines

7. UNDERGRADUATE RESEARCH STUDENTS ADVISED (THESIS/ENGAGED LEARNING)

May 2021 **Sisi Kang**, *Engaged Learning*, Topic: *Child Computer Interaction Techniques in Audio-based Interfaces for English Language Learners in STEM*
Publications: [OP.13], *Current Position*: Developer in AT&T Leadership Program

May 2016 **Ashley Parks**, *Engaged Learning*, Topic: *Calibration of Vortex Whistles for Ultra Low Cost Spirometry*
Publications: [C.26],[P.07] *Current Position*: Analyst at Toyota Connected

May 2015 **Amanda Doyle**, *Engaged Learning and Undergraduate Honors Thesis*
Honors Thesis: *Overcoming Barriers to Cervical Cancer Screening: Mobile Development*
Publications: [J.10], *Current Position*: Leadership Program at GE

May 2015 **Kevin Donahoo**, *Engaged Learning and Undergraduate Honors Thesis*
Honors Thesis: *Overcoming Barriers to Cervical Cancer Screening: Gesture Analytics*
Publications: [J.10], *Current Position*: Analyst at AT&T

May 2015 **Nathan Hillis**, *Engaged Learning and Undergraduate Honors Thesis*
Honors Thesis: *Overcoming Barriers to Cervical Cancer Screening: Image Analytics*
Publications: [J.10]

8. HONORS AND AWARDS

2022 Courtesy Appointment in Department of Operations Research and Engineering Management
2021 Nominated for President's Associates Teaching Award (*among all Tenured Faculty*)
2020 IITSEC 2020 Platinum Overall **Best Paper** Award (*Senior Author, as Professor*)
2018 Senior Research Investigator, Darwin Deason Institute for Cybersecurity
2017 Fellow, Hunt Institute for Engineering and Humanity
2016 CHI 2016 **Best Paper** Award Nomination (*Supporting Author, as Professor*)
2015 SMU HOPE Professor of the Year, Honoring Our Professors of Excellence (HOPE)
2014 UbiComp 2014 **Best Paper** Award Nomination, Seattle, WA (*Senior Author, as Professor*)
2012 UW College of Engineering Student Research Innovator
UbiComp 2012 **Best Paper** Award Nomination (*First Author, as Student*)
Madrona Prize for Research Excellence and Commercial Appeal, UW CSE Affiliates 2012
CHI 2012 **Best Paper** Award Nomination (*Supporting Author, as Student*)
Intel Science and Technology Fellowship
2011 CHI 2011 **Best Paper** Award Nomination (*First Author, as Student*)
2010 Yang Research Award Finalist
Chair's Award for Outstanding Teaching Assistant
Madrona Prize for Research Excellence and Commercial Appeal, UW CSE Affiliates 2010
2009 UbiComp 2009 **Best Paper** Award Nomination (*Supporting Author, as Student*)
2008 OSU Distinguished Regents Scholarship
2006 President of Eta Kappa Nu Omega Chapter
2004 Inducted into Eta Kappa Nu, Electrical Engineering Honor Society
Dowty-Carlson Scholarship Recipient
2002 Naeter Scholarship Recipient

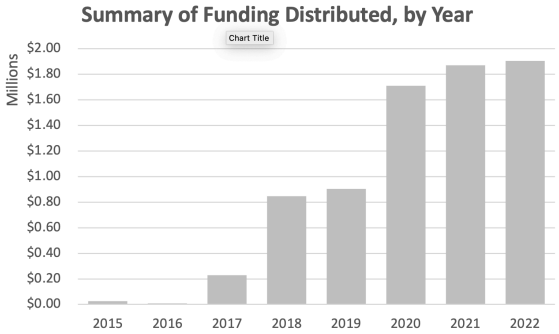
9. RESEARCH PRODUCTIVITY SUMMARY

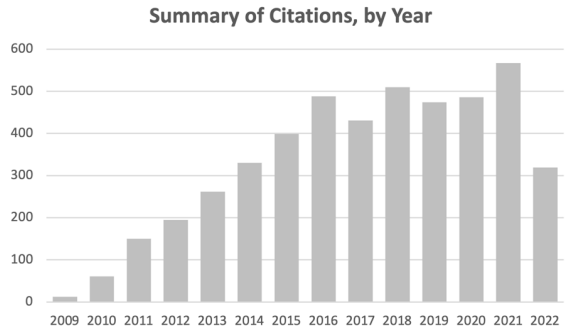
Funding Summary:

Total Number of Awarded Projects: 37 (Median $75k, Avg: $275k Range: $40k-$1.5M)
Associate Professor (2019, June-*pres*.): $5.5M (8 Agencies including NSF, ONR, IES, DHS)
Assistant Professor (2013-2019, May): $2.8M (6 Agencies including DNDO, NIH)
Average Yearly Research Expenditure: $340,000+ (Highly ranked in Lyle School of Engineering)

Publications Summary:

Total Peer Reviewed Publications: 71 (23 Journal Papers, 48 Conference Papers)
Other Research Publications: 17 (Workshop and ArXiv Papers)
H-Index: (*All Time*: 26, *Past Five Years*: 21) **Citations**: 4,700+
Google Scholar Profile: https://scholar.google.com/citations?hl=en&user=vThE9GIAAAAJ





10. EXTERNAL FUNDING AND SPONSORED RESEARCH

*__WARNING__ - This section contains funding descriptions that are restricted by the International Traffic in Arms Regulations (ITAR). Other projects may be under NDA. As such, further information about the research may not be available.

2022 [EF.37] Goldman-Sachs (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson,**
Title: "Remote Employee Insider Threat Detection"
Amount: $250,000, *Duration*: August 2022—August 2023

2022 [EF.36] PI *Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton, Joseph Houpt
Title: "Human Machine Teaming in Simulated High Load Environments"
Amount: $100,000, *Duration*: June 2022—December 2022

2022 [EF.35] PI *Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "Guardian Angel Mobile Application (Phase II)"
Amount: $40,000, *Duration*: June 2022—December 2022

2022 [EF.34] PI *Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "Phase 2: RTX Applications of Artificial Intelligence to Defense Systems (RAAIDS)"
Amount: $365,000, *Duration*: January 2022—May 2023

2021 [EF.33] * Office of Naval Research
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Research and Development of AI/ML Methods to Support Naval Logistics, Phase 3"
Amount: $119,117, *Duration*: October 2021—October 2022

2021 [EF.32] PI
*Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "*Applying Machine Learning for State Based Anomaly Detection on Embedded Communication Protocols*"
Amount: $45,000, *Duration*: October 2021—March 2022

2021 [EF.31] PI
*Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "RAAIDS for Human Machine Teaming"
Amount: $50,000, *Duration*: August 2021—December 2021

2021 [EF.30] PI
*CAE USA, formerly L3Harris (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Suku Nair
Title: "Phase IV: Human Performance Optimization using Biometric Indices"
Amount: $69,042, *Duration*: June 2021—May 2022

2021 [EF.29] PI
*Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "User-based Authentication Methods with Mobile Device Latent Vectors"
Amount: $40,000, *Duration*: June 2021—December 2021

2021 [EF.28] PI
*Raytheon Systems (Private Sponsored)
PI: **Eric C. Larson**, *Co-PIs*: Mitch Thornton
Title: "RTX Applications of Artificial Intelligence to Defense Systems (RAAIDS)"
Amount: $175,000, *Duration*: March 2021—December 2021

2021 [EF.27]
*Raytheon Systems (Private Sponsored)
PI: Mitch Thornton , *Co-PIs*: **Eric C. Larson**, Duncan MacFarlane
Title: "Refinement and Development Activities for Innovative Security Solutions"
Amount: $150,000, *Duration*: January 2021—December 2021

2021 [EF.26] PI
Intuitive Robotic Surgery
PI: **Eric C. Larson,** *Co-PIs*: Jeffrey Gahan, Alaina Garbens
Title: "Using a multi-task convolutional neural network to predict surgeon skill in robot assisted partial nephrectomy"
Amount: $50,243, *Duration*: January 2021—May 2022

2020 [EF.25]
Institute of Education Services
PI: Joseph Nese (University of Oregon), *Co-PIs*: **Eric C. Larson**, Akihito Kamata,
Title: "A Comprehensive Measure of Reading Fluency: Uniting and Scaling, Accuracy, Rate, and Prosody"
Amount: $588,085, *Duration*: September 2020—June 2024

2020 [EF.24]
Toyota Connected (Private Sponsored)
PI: Ping Gui, *Co-PIs*: **Eric C. Larson,** Mitch Thornton
Title: "CAN Bus Packet Authentication Research"
Amount: $306,391, *Duration*: May 2020—May 2022

2020 [EF.23] PI
*L3 Harris (Private Sponsored)
PI: **Eric C. Larson** , *Co-PIs*: Suku Nair
Title: "Phase III: Human Performance Optimization using Biometric Indices"
Amount: $56,193, *Duration*: February 2020—October 2020

2020 [EF.22]
Institute of Education Services
PI: Doris Baker (University of Texas, Dallas), *Co-PIs*: **Eric C. Larson**, Akihito Kamata, C. Richards
Title: "Project MELVA-S: IES Measurement"
Amount: $1,399,977, *Duration*: July 2020—June 2024

2020 [EF.21]
*Raytheon Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "TAK as a Service"
Amount: $19,990, *Duration*: April 2020—September 2020

2020 [EF.20] PI
University of Texas, Southwestern Medical Institute
PI: **Eric C. Larson,** *Co-PIs*: None
Title: "Robotic Surgery Research"
Amount: $23,760, *Duration*: August 2020—December 2020

2020 [EF.19] PI
*Raytheon Space and Airborne Systems (Private Sponsored)
PI: **Eric C. Larson ,** *Co-PIs*: Mitch Thornton
Title: "Cyber Anomaly Detection from Serial Data Bus with Context Vectors"
Amount: $75,490, *Duration*: May 2020—December 2020

2020 [EF.18]
* Office of Naval Research
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Research and Development of AI/ML Methods to Support Naval Logistics"
Amount: $50,000, *Duration*: May 2020—May 2021

2019 [EF.17]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Data Correlation Investigation to Identify Side Channel Indicators"
Amount: $50,000, *Duration*: September 2019—March 2020

2019 [EF.16]
National Science Foundation
PI: Corey Clark, *Co-PIs*: **Eric C. Larson,** Leanne Ketterlin-Geller
Title: "STEM+C: Teaching Computer Science and Computational Thinking with Community Gaming"
Amount: $1,521,616, *Duration*: September 2019—August 2023

2019 [EF.15] PI
*L3 Harris (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Suku Nair
Title: "Human Performance Optimization using Biometric Indices and Gaze"
Amount: $73,860, *Duration*: September 2019—December 2019

==========Promotion to Associate Professor with Tenure==========
Pre-Associate Funding: $2.7M

2019 [EF.14]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Cyber Security Research Projects"
Amount: $40,000, *Duration*: August 2019—March 2020

2019 [EF.13] PI
*Amida Technolgies (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Jennifer Dworak
Title: "Trojan Placement through Estimation of Criticality and Observability with Recurrent Neural Networks"
Amount: $60,000, *Duration*: June 2019—March 2020

2018 [EF.12]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Third-Party Data Supply Chain Integrity Enhancement"
Amount: $75,000, *Duration*: December 2018—December 2019

2018 [EF.11] PI
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Mitch Thornton
Title: "Investigation of Unconventional Biometrics with Mobile Devices "
Amount: $75,000, *Duration*: December 2018—December 2019

2018 [EF.10]
Department of Homeland Security
PI: Bruce Gnade, *Co-PIs*: **Eric C. Larson**, Joseph Camp, Manuel Quevedo (UTD)
Title: "Radiation Background Characterization for Enhanced Anomaly Detection"
Yearly Amount: $305,690, *Incrementally Awarded to*: $1,505,787, *Duration*: September 2018—August 2023

2018 [EF.09] PI
*L3 Link (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Suku Nair
Title: "Human Perf. Optimization using Biometric Indices: Validation for Targeted Pilot Population"
Amount: $65,000, *Duration*: September 2018—December 2018

2018 [EF.08] PI
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Mitch Thornton
Title: "Unconventional Biometrics with Mobile Devices and Machine Learning"
Amount: $100,000, *Duration*: May 2018—May 2019

2018 [EF.07]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "IoT Device Sensor Arrays"
Amount: $130,000, *Duration*: Jun. 2018—Mar. 2019

2018 [EF.06]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**
Title: "Network Discovery Research"
Amount: $100,000, *Duration*: May 2018—May 2019

2017 [EF.05]
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: Mitch Thornton, *Co-PIs*: **Eric C. Larson**, Fred Chang
Title: "IoT Distributed Sensors Research"
Amount: $100,000, *Duration*: Sep. 2017—May. 2018

2017 [EF.04] PI
DigiDoc Technologies (Private Sponsored)
PI: **Eric C. Larson** (100%)
Title: "Data collections and algorithmic development for blood oxygenation measurement using commodity smartphone cameras"
Amount: $29,110, *Duration*: Jun. 2017—Jun. 2018

2017 [EF.03] PI
*Raytheon Information and Intelligence Systems (Private Sponsored)
PI: **Eric C. Larson,** *Co-PIs*: Mitch Thornton, Fred Chang
Title: "Mission Value Calculus Engine in Support of Decision Making and Asset Allocation"
Amount: $100,000, *Duration*: Sep. 2017—May. 2018

2016 [EF.02] PI
DigiDoc Technologies (Private Sponsored), Undergraduate Fellowship
PI: **Eric C. Larson**
Title: "Undergraduate Fellowship in CS with Speci. in Asthma Management using Smartphones "
Amount: $10,000, *Duration*: Jan. 2016—May 2016

2015 [EF.01]
National Institutes of Health (NIH), Exploratory/Developmental Bioengineering Research Grants (EBRG) [R21]
PI: James Taylor (UW), *Co-PIs*: **Eric C. Larson,** James Stout (UW), Shwetak Patel (UW, advisor)
Title: "An Evaluation of a Novel Technology to Assess Neonatal Jaundice"
Total Amount: $428,315, *Duration*: Apr. 2015—Mar. 2018

11. INTERNAL FUNDING

2020 [IF.07]
Lyle School of Engineering Research Seed Funding
PI: Paul Krueger, *Co-PIs*: **Eric C. Larson**
Title: "Determination of Flow Generation Geometry Using Machine Learning"
Amount: $31,680, *Duration*: August 2020—Dec. 2020

2019 [IF.06]
Lyle School of Engineering Research Seed Funding
PI: Bruce Gnade, *Co-PIs*: **Eric C. Larson**
Title: "Development of CMOS-based Rotational Spectroscopy"
Amount: $30,900, *Duration*: April 2019—Dec. 2019

2018 [IF.05] PI
Lyle School of Engineering Research Seed Funding
PI: **Eric C. Larson,** *Co-PIs*: Eli Olinick, Michael Hahsler, Paul Kruger
Title: "Deep Convolutional Networks for Forgery Classification and Anomaly Detection "
Amount: $21,120, *Duration*: May 2018—Dec. 2018

2017 [IF.04] PI
Office of Provost Special Seed Funding
PI: **Eric C. Larson,** *Co-PIs*: Pavel Klimovich
Title: "Binding Affinity Prediction via Collaborative Filtering with Latent Factors"
Amount: $30,000, *Duration*: Aug. 2017—Feb. 2018

[IF.03] PI
Just-in-Time Teaching and Technology Grants
PI: **Eric C. Larson**
Title: "Augmented Reality with CoreML iOS Development for CSE5323/CSE7323"
Amount: $1,000, *Duration*: Aug. 2017—Dec. 2017

2014 [IF.02] PI
Lyle School of Engineering Research Seed Funding
PI: **Eric C. Larson,** *PI*: Joseph Camp
Title: "Phone-as-a-Sensor Health Monitoring with Body Area Networks"
Amount: $20,608, *Duration*: May 2014—Dec. 2014

2013 [IF.01] PI
SMU Laboratory Upgrade Grant
PI: **Eric C. Larson**
Title: "Laboratory Upgrades in Mobile Application Development, Embedded Mobile Sensing, and Peripheral Communication on a Mobile Device "
Amount: $14,632, *Duration*: Dec. 2013—May 2014

12. BOOKS AND BOOK CHAPTERS

*Refers to SMU Student Authors or SMU Post-doctoral Researchers in my Research Lab

2016 [B.03] **E. C. Larson**, E. Saba, S. Kaiser*, M. Goel, S. Patel (2016). Pulmonary Monitoring Using Smartphones. *Mobile Health: Sensors, Analytic Methods, and Applications*, editors James M. Rehg, Susan A. Murphy, & Santosh Kumar. Book Chapter.

2014 [B.02] M. Stiber, B. Stiber, and **E.C. Larson** (2014). Signal Computing: Digital Signals in the Software Domain. Open Access Book. Textbook.

2012 [B.01] G. Yen and **E.C. Larson** (2012). Facial Feature Tracking via Evolutionary Multi-objective Optimization. *Principal Concepts in Applied Evolutionary Computation: Emerging Trends*. Book Chapter, 4.

13. PAPERS IN SUBMISSION

* == **Refers to Student Authors or Post-doctoral Researchers**

XX [C.X] In Sub.
C. Harper,* M. Thornton, and **E. C. Larson,** (202x). Automatic Modulation Classification using Deep Learning. *In submission*.
(Impact Factor: TBD, H-5 Index: TBD)

XX [C.X] In Sub.
C. Harper,* M. Thornton, and **E. C. Larson,** (202x). Speaker Embedding with Context Vectors using Improved Latent Space Statistics Pooling. *In submission*.
(Impact Factor: TBD, H-5 Index: TBD)

XX [C.X] In Sub.
Mike Taylor*, **E. C. Larson,** and Mitch Thornton (202x). General Process Detection via Side Channel Estimation. *In submission*.
(Impact Factor: TBD, H-5 Index: TBD)

XX [C.X] In Sub.
Andrew Havard*, Theodore Maniks, **E. C. Larson,** and Mitch Thornton (202x). CNN-Based Image Stegonography. *In submission*.
(Impact Factor: TBD, H-5 Index: TBD)

XX [C.X] In Sub.
Z. Wu,* G. Alford, **E. C. Larson,** S. Stothoff, and O. Pensado (202x). Exploring Neural Networks for Predicting Sentinel-C Backscatter at High Temporal Frequencies. *In Revision*.
(Impact Factor: TBD, H-5 Index: TBD)

XX [C.X] In Sub. X. Ding*, Y. Fang, T. Han, and **E.C. Larson** (202x). "An Approach for Combining Multimodal Fusion and Neural Architecture Search Applied to Knowledge Tracing." *In Submission*.
(Impact Factor: TBD, H-5 Index: TBD)

14. REFEREED JOURNAL PUBLICATIONS

* == **Refers to Student Authors or Post-doctoral Researchers**

2022 [J.23] V. Viswanath*, J. Hoffman*, X. Ding*, **E.C. Larson**, Edward Wang (2022). Towards Ubiquitous SpO2 Sensing on Unmodified Smartphones: Deep Learning Applied to a Varied Fractional Inspired Oxygen (FiO2) Study. *NPJ Digital Medicine.* Springer Nature.
(Impact Factor: 11.65, H-5 Index: 72)

[J.22] H. Kominsky, Y. Wang,* J. Gahan, A. Garbens, and **E.C. Larson** (2022). "Using a multi-task convolutional neural network to predict surgeon skill in robot-assisted partial nephrectomy." 2022 Journal of Urology.
(Impact Factor: 7.45, H-5 Index: 80)

2021 [J.21] H. Tian*, X. Jiang*, F. Trozzi*, S. Xiao, **E. C. Larson** and P. Tao (2021). Explore protein conformational space with variational autoencoder. *Journal on Frontiers in Molecular Biosciences, section Biological Modeling and Simulation* (Frontiers). https://www.frontiersin.org/articles/10.3389/fmolb.2021.781635/full
(Impact Factor: 4.62, H-5 Index: 42)

[J.20] Y. Wang*, J. Dai, T. Morgan, M. Elsaid*, A. Garbens, X. Qu*, R. Steinberg, J. Gahan, and **E.C. Larson** (2021). "Evaluating Robotic-Assisted Surgery Training Videos with Multi-task Convolutional Neural Networks." *Journal of Robotic Surgery* (JORS), 2021. Doi: 10.1007/s11701-021-01316-2.
(Impact Factor: 2.00, H-5 Index: 23)

[J.19] M. Makos*, N. Verma*, **E.C. Larson,** and E. Kraka (2021). Prediction of the Transition State Geometry via Generative Adversarial Network. *The Journal of Chemical Physics.*
(Impact Factor: 3.49, H-5 Index: 81)

[J.18] R. Srinivas*, N. Verma*, E. Kraka, and **E.C. Larson** (2021). Deep Learning-based Ligand Design using Shared Latent Implicit Fingerprints from Collaborative Filtering. *Journal of Chemical Information and Modeling*.
(Impact Factor: 4.96, H-5 Index: 62)

[J.17] N. Verma*, X. Qu*, F. Trozzi, Md. Elsaied*, N. Karki, P. Tao, B. Zoltowski, **E. C. Larson**, E. Kraka (2021). SSnet: A Deep Learning Approach for Protein-Ligand Interaction Prediction. *International Journal of Molecular Sciences* (IJMS), *Section of Molecular Pharmacology*.
(Impact Factor: 5.93, H-5 Index: 150)

[J.16] J. Wilson*, S. Nair, S. Scielzo, and **E.C. Larson** (March 2021). Cognition-Aware Computing: Objective Measures of Cognitive Load Using Deep Multi-Modal Learning: A Use-Case in Aviation. *Proceedings of the ACM Journal on Interactive Mobile Wearable, and Ubiquitous Technology*. Vol. 5, Issue. 1, Article 40 (March 2021), 35 pages. https://doi.org/10.1145/3448111
(Impact Factor: 2.10, H-5 Index: 45)

2020 [J.15] J. Wilson*, S. Nair, S. Scielzo, and **E.C. Larson** (August 2020). Automatic Gaze Classification for Aviators: Using Multi-task Convolutional Networks as a Proxy for Flight Instructor Observation. *International Journal of Aeronautics, Aviation, and Aerospace* (IJAAA).
(Impact Factor: 0.49, H-5 Index: 10)

[J.14] X. Ding* and **E.C. Larson** (2020). "Incorporating Uncertainties in Student Response Modeling by Loss Function Regularization." *Journal of Neurocomputing*, 2020.
(Impact Factor: 5.72, H-5 Index: 119)

[J.13] X. Ding*, Z. Raziei*, **E.C. Larson**, E. Olinick, P. Krueger, and M. Hahsler (2020). "Swapped Face Detection using Deep Learning and Subjective Assessment." *EURASIP Journal on Information Security*.
(Impact Factor: 3.17, H-5 Index: 27)

[J.12] Gahan, Jeffrey, Ryan Steinberg, Alaina Garbens (2020), *Xingming Qu, and Eric Larson. "MP34-06 Machine learning using a muti-task convolutional neural network can accurately assess robotic skills." *The Journal of Urology* 203, no. Supplement 4 (2020): e505-e505.
(Impact Factor: 7.45, H-5 Index: 80)

2019 [J.11] F. Chang, **E.C. Larson**, and M. Fontenot (2019). "Computer Science Education: Fueling Tomorrow's Technology Growth." *Georgetown Journal of International Affairs*.
https://www.georgetownjournalofinternationalaffairs.org/?category=Science+%26+Technology
(Impact Factor: N/A, H-5 Index: 11)

[J.10] X. Ding*, A. Doyle*, K. Donahoo*, E. Bing, R. Rajgopal, and **E.C. Larson** (2019). "EduAware: Using Tablet-Based Navigation Gestures to Predict Learning Module Performance." *Journal of Interactive Learning Environments*. https://www.tandfonline.com/doi/abs/10.1080/10494820.2019.1609524
(Impact Factor: 2.87, H-5 Index: 47)

[J.09] T. Giallanza*, T. Siems*, E. Sharp*, I. Johnson*, E. Gabrielsen*, M. Thornton, and **E.C. Larson** (June 2019). Keyboard Snooping via Mobile Phones: Threats of Device Arrays. *Journal of Interactive, Wearable, and Ubiquitous Technology* (IMWUT). 2019.
(Impact Factor: 2.10, H-5 Index: 45)

2018 [J.08] X. Ding*, D. Nassehi, and **E.C. Larson**. Measuring Oxygen Saturation using Convolutional Neural Networks on Smartphones. *IEEE Journal of Biomedical and Health Informatics*, JBHI (2018).
(Impact Factor: 5.77, H-5 Index: 71)

[J.07] R. Srinivas*, P. Klimovich*, and **E.C. Larson**. Implicit-descriptor ligand-based virtual screening by means of collaborative filtering. *Journal of Cheminformatics*. 10, no. 1 (2018): 56.
(Impact Factor: 5.51, H-5 Index: 42)

2017 [J.06] C. Wangwiwattanna*, X. Ding*, and **E.C. Larson**. PupilNet, Measuring Task Evoked Pupillary Response using Commodity RGB Tablet Cameras: Comparison to Mobile, Infrared Gaze Trackers for Inferring Cognitive Load (Dec. 2017). *Journal of Interactive, Wearable, and Ubiquitous Technology* (IMWUT).
(Impact Factor: 2.10, H-5 Index: 45)

[J.05] J. Taylor, J. Stout, L. deGreef, M. Goel, S.N. Patel, E. Chung, A. Koduri, S. McMahon, J. Dickerson, E. Simpson, and **E. C. Larson** (2017). Use of a Smartphone App to Assess Neonatal Jaundice. *Journal of Pediatrics*. August 2017: p.e20170312.
(Impact Factor: 7.13, H-5 Index: 120)

2011 [J.04] **E. C. Larson**, J. Froehlich, T. Campbell, C. Haggerty, L. Atlas, J. Fogarty, and S. N. Patel, (2011). "Disaggregated Water Usage Sensing from a Single, Non-Intrusive Sensor: an Extended Analysis of HydroSense using Staged Experiments." *The Pervasive and Mobile Computing Journal* (PMC). 8(1):82-102.
(Impact Factor: 4.67, H-5 Index: 45)

[J.03] J. Froehlich, **E.C. Larson**, S. Gupta, G. Cohn, M. Reynolds, S.N. Patel (2011). "Disaggregated End-Use Energy Sensing for the Smart Grid" *IEEE Pervasive Computing, Special Issue on Smart Energy Systems*. 10(1):28-39.
(Impact Factor: 3.175, H-5 Index: 25)

2010 [J.02] **E. C. Larson** and D. M. Chandler (2010). "The Role of Strategy in Image Quality: The Most Apparent Distortion," *Journal of Electronic Imaging*, 19(1), 011006, January-March 2010.
Featured on Cover, Most Cited Article in JEI
(Impact Factor: 0.95, H-5 Index: 25)

2010 [J.01] **E. C. Larson** and G. Yen (2010). "Facial Feature Tracking via Evolutionary Multi-objective Optimization," *International Journal of Applied Evolutionary Computation* (IJAEC), 1(1):57-71, 2010.
(Impact Factor: 3.83, H-5 Index: 28)

15. REFEREED CONFERENCE PUBLICATIONS

* == **Refers to Student Authors or Post-doctoral Researchers**

2022 [C.48] H. Tian*, X. Jiang*, H. La Force*, S. Xiao, **E. C. Larson** and P. Tao (2022). LAST: Latent Space Adaptive Sampling for Protein Trajectories. Thirty Ninth Annual International Conference on Machine Learning (ICML), Special Workshop on AI4Science. *To Appear*.
(Impact Factor: 18.48, H-5 Index: 204, 19th highest ranked publication venue, via Google Metrics 2022)

2022 [C.47] Mike Taylor*, **E. C. Larson,** and Mitch Thornton (2022). General Process Detection Through Physical Side Channel Characterization. *IEEE International Conference on Systems* (SysCon 2022).
(H-5 Index: 19)

[C.46] G. Sammit,* Z. Wu,* Y. Wang,* Z. Wu,* A. Kamata, J. Nese, and **E. C. Larson** (2022). Automated Prosody Classification for Oral Reading Fluency with Quadratic Kappa Loss and Attentive X-vectors. *International Conference on Acoustics, Speech, and Signal Processing* (ICASSP 2022).
(Impact Factor: 4.96, H-5 Index: 96)

[C.45] Foster, P.*, Tseng, C.*, Klinkert, L. J.*, Adams, E. L., Ketterlin-Geller, L. R., **Larson, E. C.,** & Clark, C. (2022, April). *Assessing middle school student computational thinking in an immersive game environment*. Poster submitted to the National Council for Measurement in Education (NCME), San Diego, CA.
(Impact Factor: 1.0)

[C.44] N. Crothers*, Y. Sinha*, S. Scielzo, and **E.C. Larson** (2022). "Real-Time Situation Awareness Assessment for Pilots via Machine Learning: Constructing an Automated Classification System." *Modeling & Simulation* (MODSIM) World 2022.
(Impact Factor: 1.60)

[C.43] M. Lee*, J. Sylvester*, S. Aggarwal*, M. Thornton, and **E.C. Larson** (2022). "Side Channel Identification using Granger Time Series Clustering with Applications to Control Systems." *International Conference on Information Systems Security and Privacy* (ICISSP 2022). 8 pgs.
(H-5 Index: 13)

[C.42] Tseng, C.,* Foster, P. D.,* Adams, E. L., Ketterlin-Geller, L. R., **Larson, E. C.,** Luo, V., Klinkert, L. J., & Clark, C. (2022). *Incorporating teacher voice in the development of game-based learning environments.* American Educational Research Association 2022, San Diego, CA.
(Impact Factor: 2.46, H-5 Index: 38)

2021 [C.41] J. Sylvester*, M. Lee*, M. J. Hornbach, M. Thornton, **E.C. Larson**, S. Aggarwal, M. Manga, S. Hurwitz, A. Calvert, S. Wilkinson, B. Miller, and Z. Smith (2021). Time Series Clustering using Granger Causality to Identify Time Series Applicable to Forecasting Internal Waves in Lake and Marine Environments. *American Geophysical Union Annual Meeting* (AGU21). *Accepted for Poster Presentation and Lightning Presentation.* December 2021.
(Impact Factor: 4.26, H-5 Index: 33)

[C.40] Luo, V.*, Klinkert, L. J.*, Tseng, C.*, Foster, P. D.*, Adams, E. L., Ketterlin-Geller, L. R., Clark, C, and **Larson, E. C.**. (2021). A Multidisciplinary Approach To Designing Immersive Gameplay Elements for Learning Standard-Based Educational Content. *In CHI PLAY'21: Annual Symposium on Computer-Human Interaction in Play*, October, 2021. ACM, New York, NY, USA, 9 Pgs.
(Impact Factor: 2.73, H-5 Index: 6 (young venue))

[C.39] C. Harper*, A. Sinha*, M. Thornton, and **E.C. Larson** (November 2021). "SNR-Boosted Automatic Modulation Classification." *Annual Asilomar Conference on Signals, Systems, and Computers*, Asilomar 2021.
(H-5 Index: 30)

[C.38] A. Sinha*, M. Taylor*, N. Srirama*, T. Manikas, **E.C. Larson**, and M. Thornton, (2021). "Industrial Control System Anomaly Detection Using Convolutional Neural Network Consensus." 5th IEEE Conference on Control Technology and Applications (CCTA 2021).
(H-5 Index: 20)

[C.37] M. Taylor*, **E.C. Larson**, and M. Thornton, (2021). "Rapid Ransomware Detection Through Side Channel Exploitation." 2021 IEEE Conference on Cyber Security and Resilience (IEEE-CSR 2021).
(H-5 Index: 13)

[C.36] E. Tsang*, P. Foster, E. Adams, L. Ketterlin-Geller, **E.C. Larson**, and C. Clark (2021). "A Standard Decomposition Process to Inform the Development of Game-Based Learning Environments Focused on Computational Thinking." International Conference of Computational Thinking and STEM Education 2021 (CTE-STEM 2021).
(no metrics available, < 4 years)

[C.35] R. Oshanna*, M. Thornton, **E.C. Larson**, and X. Romague (2021). "Realtime edge processing detection of malicious attacks using machine learning and processor core events." 15th Annual IEEE International Systems Conference (SysCon 2021).
(H-5 Index: 19)

[C.34] L. Wood* and **E.C. Larson** (2021). "Parametric Spectral Filters for Fast Converging, Scalable Convolutional Neural Networks." International Conference on Acoustics, Speech, and Signal Processing. ICASSP 2021.
(Impact Factor: 4.96, H-5 Index: 96)

2020 [C.33] C. Harper*, L. Lyons*, M. Thornton, and **E.C. Larson** (November 2020). "Enhanced Automatic Modulation Classification using Deep Convolutional Latent Space Pooling." Annual Asilomar Conference on Signals, Systems, and Computers, 2020.
(H-5 Index: 30)

[C.32] S. Scielzo, J. Wilson*, and **E.C. Larson** (June 2020). "Towards the Development of an Automated, Real-Time, Objective Measure of Situation Awareness for Pilots." Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC).
Overall Best Paper Winner, Platinum Paper (*Winner among all papers at conference*)
(H-5 Index: 15)

[C.31] X. Ding* and **E.C. Larson** (2020). "Automatic RNN Cell Design for Knowledge Tracing using Reinforcement Learning." 2020 ACM Conference on Learning at Scale.
(Impact Factor: 2.06, H-5 Index: 26)

2019 [C.30] X. Ding* and **E.C. Larson** (2019). "Why Deep Knowledge Tracing has less Depth than Anticipated." 2019 Conference on Educational Data Mining.
(Impact Factor: 1.57, H-5 Index: 27)

[C.29] T. Giallanza*, E. Gabrielsen*, M. Taylor*, **E.C. Larson,** and M. Thornton (2019). "Task Value Calculus: Fast Adaptive Optimization of Tasks for Multi-objective Diagrams." International Symposium on Multi-Valued Calculus. May 2019, Alberta, CA.
(Impact Factor: 0.96, H-5 Index: 27)

[C.28] S. Douglas and **E.C. Larson** (2019). "Relationships Between Deep Learning and Linear Adaptive Systems." International Conference on Acoustics, Speech, and Signal Processing. ICASSP 2019.
Invited Paper.
(Impact Factor: 4.96, H-5 Index: 96)

2016 [C.27] S. Kaiser*, A. Parks*, P. Leopard*, C. Albright*, J. Carlson*, M. Goel, D. Nassehi, **E.C. Larson.** (2016). Design and learnability of vortex whistles for managing chronic lung function via smartphones. In Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2016). Heidleberg, Germany. September 2016.
Acceptance Rate: 26% (101/389) (Impact Factor: 1.02, H-5 Index: 47)

[C.26] M. Goel, E. Saba, M. Stiber, E. Whitmire, J.Fromm, **E.C. Larson,** G. Borriello, S. Patel (2016). Spirocall: Measuring lung function over a phone call. In Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems 2016 May 7 (CHI 2016).
Nominated for Best Paper
Acceptance Rate: 23% (565/2435) (Impact Factor: 2.73, H-5 Index: 101)

2015 [C.25] S. Rafiqi*, C. Wangwiwattana*, E. Fernandez, S. Nair, and **E. C. Larson** (2015). "Work-in-progress, PupilWare-M : Cognitive Load Estimation Using Unmodified Smartphone Cameras." 12th Annual IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS 2015). Dallas, TX. October 2015.
(H-5 Index: 18)

[C.24] S. Rafiqi*, C. Wangwiwattana*, J. Kim*, E. Fernandez, S. Nair, and **E. C. Larson** (2015). "PupilWare: Towards Pervasive Cognitive Load Measurement using Commodity Devices." 8th International Conference on Pervasive Technology Related to Assistive Environments (PETRA 2015). Corfu, Greece. July 2015.
(H-5 Index: 3)

[C.23] K. Chen, S. Gupta, **E. C. Larson**, S. Patel (2015). "DOSE: Detecting User-Driven Operating States of Electronic Devices from a Single Sensing Point." Proceedings of the International Conference on Pervasive Computing (PerCom 2015). Saint Louis, Missouri. January 2015.
(Impact Factor: 2.23, H-5 Index: 27)

2014 [C.22] L. DeGreef, M. Goel, M. Seo, J. Stout, J. Taylor, **E.C. Larson**, and S. Patel (2014). "BiliCam: Using Mobile Phones to Measure Newborn Jaundice." Proceedings of the 16th International Conference on Ubiquitous Computing. (UbiComp 2014). Seattle, WA. September 2014.
Nominated for Best Paper
Acceptance Rate: 21% (94/454) (Impact Factor: 1.02, H-5 Index: 47)

[C.21] **E.C. Larson** (2014). "Consumer Centered Calibration for End-use Water Monitoring." Proceedings of the Workshop on Non-intrusive Load Monitoring 2014.
Acceptance Rate: 30% (7/23)

2013 [C.20] J. Lindsay, I. Jiang**, E.C. Larson**, R. Adams, S.N. Patel, & B. Hannaford (2013). "Good Vibrations: An Evaluation of Vibro-tactile Impedance Matching for Low Power Wearable Applications." Proceedings of UIST 2013. St. Andrews, UK, October 8-11, 2013.
Acceptance Rate: 19% (60/317) (Impact Factor: 6.01, H-5 Index: 42)

[C.19] M. Aumi, S. Gupta, M. Goel, **E.C. Larson**, and S.N. Patel (2013). "DopLink: Using the Doppler Effect for Multi-Device Interaction." Proceedings of the 15th International Conference on Ubiquitous Computing. (UbiComp 2013). Zurich Switzerland. September 8-12, 2013.
Acceptance Rate: 23% (92/394) (Impact Factor: 1.02, H-5 Index: 47)

[C.18] **E.C. Larson**, M. Goel, M. Redfield, G. Boriello, M. Rosenfeld, and S.N. Patel (2013). Tracking lung function on any phone. Proceedings of the 3rd ACM Symposium on Computing for Development, 29:1-29:2. 10.1145/2442882.2442917
(Impact Factor: 1.04, H-5 Index: 23)

2012 [C.17] **E.C. Larson**, M. Goel, G. Boriello, S. Heltshe, M. Rosenfeld, and S.N. Patel (2012). "SpiroSmart: Using a Microphone to Measure Lung Function on a Mobile Phone." Proceedings of the 14th International Conference on Ubiquitous Computing (UbiComp 2012), Pittsburgh, USA, Sep 5-8, 2012.
Nominated for Best Paper
Acceptance Rate: 19% (58/301) (Impact Factor: 1.02, H-5 Index: 47)

[C.16] J. Froehlich, L. Findlater, M. Ostergren, S. Ramanathan, J. Peterson, I. Wragg, **E.C. Larson**, F. Fu, M. Bai, S.N. Patel, J. Landay (2012). "The Design and Evaluation of Prototype Eco-Feedback Displays for Fixture-Level Water Usage Data." Proceedings of the 2012 ACM Annual Conference on Human Factors in Computing Systems (CHI 2012), 2367-2376, Austin, TX May 2012.
Best Paper Honorable Mention
Acceptance Rate: 23% (363/1577) Acceptance Rate: 25% (Impact Factor: 2.73, H-5 Index: 101)

[C.15] T. Phan, **E.C. Larson**, S. Sohoni, and D. Chandler (2012). "Performance-Analysis-Based Acceleration of Image Quality Assessment." IEEE Southwest Symposium on Image Analysis and Interpretation (SSIAI 2012), 81-84, April 2012.
(H-5 Index: 11)

[C.14] E. Saba, **E. C. Larson**, and S. N. Patel (2012). "DANTE Vision: In-Air and Touch Gesture Sensing for Natural Surface Interaction with Combined Depth and Thermal Cameras." First Annual Conference on Emerging Signal Processing Applications (ESPA 2012), 167-170, January 2012.
Acceptance Rate: 38% (52/137)

2011 [C.13] **E. C. Larson** T. Lee, S. Liu, M. Rosenfeld, and S. N. Patel (2011). "Accurate and Privacy Preserving Cough Sensing from a Low Cost Microphone." Proceedings of the 13th International Conference on Ubiquitous Computing (UbiComp 2011), 375-384, Beijing, China, September 2011.
Acceptance Rate 16.6% (50/302) (Impact Factor: 1.02, H-5 Index: 47)

[C.12] **E.C. Larson**, J. Froehlich, E. Saba, T. Campbell, L. Atlas, J. Fogarty, S.N. Patel (2011). "A Longitudinal Study of Pressure Sensing to Infer Real-World Water Usage Events in the Home." Proceedings of the Ninth International Conference on Pervasive Computing (Pervasive 2011). 50-69, San Francisco, CA, June 12-15, 2011.
Acceptance Rate: 23.6% (22/93) (Impact Factor: 1.02, H-5 Index: 47)

[C.11] **E.C Larson**, G. Cohn, S. Gupta, X. Ren, B. Harrison, D. Fox, S.N. Patel (2011) "HeatWave: Thermal Imaging for Surface user Interaction." Proceedings of the 2011 ACM Annual Conference on Human Factors in Computing Systems (CHI 2011), 2565-2574, Vancouver, Canada, May 7 - 12, 2011.
Best Paper Honorable Mention
Acceptance Rate: 25% (Impact Factor: 2.73, H-5 Index: 101)

2010 [C.10] T. Campbell, **E.C. Larson**, G. Cohn, J. Froehlich, R. Alcaide and S.N. Patel (2010). "WATTR: A Method for Self-Powered Wireless Sensing of Water Activity in the Home." In Proceedings of the 12th ACM International Conference on Ubiquitous Computing (UbiComp 2010). 169-172, Copenhagen, Denmark, September 2010.
Acceptance Rate: 19% (39/202) (Impact Factor: 1.02, H-5 Index: 47)

[C.09] G. Cohn, S. Gupta, J. Froehlich, **E. C. Larson**, and S. Patel (2010). "GasSense: Appliance-Level, Single-Point Sensing of Gas Activity in the Home" Proceedings of the Eighth International Conference on Pervasive Computing (Pervasive 2010), 265-282, Helsinki, Finland, May 17-20.
Acceptance Rate: 17% (Impact Factor: 1.02, H-5 Index: 47)

2009 [C.08] J. Froehlich, **E. C. Larson**, C. Haggerty, T. Campbell, S. Patel, and J. Fogarty (2009). "HydroSense: Infrastructure-Mediated Single-Point Sensing of Whole Water Home Activity In Proceedings of the 11th ACM International Conference on Ubiquitous Computing (UbiComp 2009), Orlando, FL, Sep. 2009.
Nominated for Best Paper
Acceptance Rate: 12.4% (Impact Factor: 1.02, H-5 Index: 47)

[C.07] **E. C. Larson** and D. M. Chandler (2009). "The Most Apparent Distortion: A Dual Strategy for Full Reference Image Quality," Proc. SPIE Image Quality and System Performance, 7242, January 2009.
(Impact Factor: 0.45, H-5 Index: 23)

2008 [C.06] **E. C. Larson** and D. Chandler (2008). "Unveiling relationships between regions of interest and image fidelity metrics." Visual Communications and Image Processing 2008 (VCIP 2008), 6822, 2008.
(Impact Factor: 0.44, H-5 Index: 20)

[C.05] **E. C. Larson** and G. Yen (2008). "Facial feature tracking in dynamic bandwidth environments: a genetic approach," IEEE World Congress on Computational Intelligence (CEC 2008), 2819-2826, June 2008.
(Impact Factor: 0.73, H-5 Index: 8)

[C.04] V. Kadiyala, S. Pinneli, **E. C. Larson**, and D. M. Chandler (2008). "Quantifying the Perceived Interest of Objects in Images: Effects of Size, Location, Blur, and Contrast," Proc. Human Vision and Electronic Imaging 2008 (HVEI 2008), San Jose, CA, January 2008.
(H-5 Index: 5)

[C.03] **E. C. Larson**, C. Vu, and D. Chandler (2008). "Can Visual Fixation Patterns Improve Image Fidelity Assessment?," Proc. of the International Conference on Image Processing (ICIP 2008), 2572-2575, 2008.
(Impact Factor: 2.08, H-5 Index: 60)

[C.02] C. Vu, **E.C. Larson**, and D.M. Chandler (2008). Visual fixation patterns when judging image quality: Effects of distortion type, amount, and subject experience. In *Image Analysis and Interpretation, 2008. SSIAI 2008. IEEE Southwest Symposium on* (pp. 73-76). IEEE.
(H-5 Index: 11)

2007 [C.01] **E. C. Larson** and D. Chandler (2007). "Explaining Crypsis and Information Content in the Mammalian Visual Pathway using Statistical Measures of Animal Camouflage," OSA Fall Vision Meeting 2007, January 2007.

16. PATENTS

2021 [P.09] Thornton, M. A., **Larson, E. C.,** Manikas, T. W., Taylor, M. A., Sinha, A., Srirama, N., Patent, "Computing System Network Anomaly Detection Using Packet Prediction and External Sensors", 63/211,281, Provisional, United States, Ironwood Cyber, Inc. *Provisional Patent Filed*.

2018 [P.08] **E.C. Larson**, M. Thornton, I. Johnson*, E. Gabrielsen*, and T. Siems*. Generating Upsampled Signals from Gyroscope App No. 16/702,116.
License Agreement with Ironwood Cyber

2017 [P.07] **E.C. Larson**, Spencer Kaiser*, Ashley Parks*, Patrick Leopard*, and Damoun Nassehi (2017). Vortex Whistle Devices and Systems and Methods for Spirometry Measurements. App No. 15/702351. US Patent Pending.
License Agreement with DigiDoc Technologies

2014 [P.06] **E.C. Larson**, M. Goel, L. DeGreef, S. Patel, J. Stout, and J. Taylor (2014). "Devices, Systems and Methods for Estimating Bilirubin Levels." App No. PCT/US2014/024761. US Patent Pending
License Agreement with Google

[P.05] **E.C. Larson**, M. Goel, and S.N. Patel (2014). "Sound-Based Spirometric Devices, Systems and Methods." App. No. 14/400,064. US Patent Pending
License Agreement with Google

2013 [P.04] T. Campbell, **E.C. Larson**, G. Cohn, S.N. Patel (2013). "Automatic Valve Shutoff Device and Methods." WO Patent 2,013,106,690. US Patent Pending.
License Agreement with Allstate Insurance

2012 [P.03] S. Patel, **E.C. Larson**, T. Lee, S. Liu (2012). "Cough Detecting Methods and Devices for Detecting Coughs." WO Patent 2,013,040,485. US Patent Pending.
License Agreement with Google

[P.02] T. Campbell, **E. C. Larson**, G. Cohn, R. Alcaide, J. Froehlich, S. Patel (2012). "Systems and Methods for Energy Harvesting in a Contained Fluid Circuit." WO Patent 2,012,021,551. US Patent Pending.

2009 [P.01] S. Patel, J. Fogarty, J. Froehlich, **E. C. Larson**. "Sensing Events Affecting Liquid Flow in a Liquid Distribution System." EP Patent 2,440,901.
License Agreement with Phin Technologies and Belkin Technologies

17. OTHER PUBLICATIONS (NOT PEER REVIEWED)

These publications refer to publications resulting from student projects in the SMU Master of Science in Data Science which are **internally reviewed at SMU,** or other sources with **only minimal or no peer review** (such as arXiv paper posts). While these publications represent excellent projects that may be cited for their scholarly contributions, they **do not count toward peer-reviewed citations**.

2022 [OP.17] H. Tian, X. Jiang, S. Xiao, H. LaForce, **E. C. Larson** and P. Tao (2022). LAST: Latent Space Assisted Adaptive Sampling for Protein Trajectories. *arXiv :2204.13040*; 2022. https://arxiv.org/pdf/2204.13040

[OP.16] Tseng, C.,* Foster, P. D.,* Klinkert, J.,* Adams, E. L., Clark, C., **Larson, E. C.,** & Ketterlin-Geller, L. R. (2022). *Using cognitive walkthroughs to evaluate students' computational thinking during gameplay.* Paper to be presented to the International Conference of the Mathematics Education for the Future Project, King's College, Cambridge University, UK.

2021 [OP.15] H. Tian, X. Jiang, F. Trozzi, S. Xiao, **E. C. Larson** and P. Tao (2021). Exploring the protein conformational space with variational autoencoder. *ChemRXiv*. Cambridge: Cambridge Open Engage; 2021. https://chemrxiv.org/engage/chemrxiv/article-details/6149299187a02de46f4294ec

[OP.14] Klinkert*, L. J., Foster*, P. D., Adams, E. L., Clark, C., Ketterlin-Geller, L., **Larson, E.C.**, Tseng*, C-Y., and Luo*, V. (2021). *Building Student Computational Thinking using Online Gaming*. 2021 STEM for All Video Showcase. https://stemforall2021.videohall.com/presentations/1994

[OP.13] Sisi Kang* and **E.C. Larson**. Automated Speech Recognition Scoring System to Enhance Child Computer Interaction in a Learning Module (2021). *SMU Journal of Undergraduate Research* (JoUR).

[OP.12] Jason S. Hoffman, Varun Viswanath, Xinyi Ding, Matthew J. Thompson, **E. C. Larson**, Shwetak N. Patel and Edward Wang. Smartphone Camera Oximetry in an Induced Hypoxemia Study. arXiv:2104.00038 http://arxiv.org/abs/2104.00038 (2021). *arXiv paper, not peer reviewed*.

[OP.11] R. Mundada*, L. Nibhrat*, A. McCarthy*, R. Howell*, and **E.C. Larson**. AirWare: Utilizing Convolutional Architectures for In-Air Hand-Gesture Recognition with Multi-modal Audio Doppler and Infrared Signals. arXiv:2101.10245 http://arxiv.org/abs/2101.10245 (2021). *arXiv paper, not peer reviewed*.

[OP.10] C. Wangwiwatanna, S. Aggarwal, and **E.C. Larson**. "Writers Gonna Wait: The Effectiveness of Notification to Initiate Aversive Action in Writing Procrastination." arXiv: 2101.10191 http://arxiv.org/abs/2101.10191 (2021). *arXiv paper, not peer reviewed*

[OP.09] X. Ding* and **Larson, E.C.** (2021). "On the Interpretability of Deep Learning Based Models for Knowledge Tracing." *Workshop at Association for the Advancement of Artificial Intelligence*. AAAI 2021. *Minimal Peer Review, Invited Submission*

2020 [OP.08] Tseng, C., Ketterlin Geller, L.R., Clark, C., **Larson, E.C.** (2020). *STEM+C educator advisory panel* (Tech Rep. No 20-18). Dallas, TX: Southern Methodist University, Research in Mathematics Education.

2019 [OP.07] X. Ding*, Z. Raziei*, **E.C. Larson**, E. Olinick, P. Krueger, and M. Hahsler. "Swapped Face Detection using Deep Learning and Subjective Assessment." *arXiv preprint* arXiv:1909.04217 (2019). *arXiv paper, not peer reviewed*

[OP.06] Verma, Niraj*, Xingming Qu*, Francesco Trozzi, Yunwen Tao, Mohamed Elsaied*, E.C. Larson, and Elfi Kraka. "SSnet-Secondary Structure based End-to-End Learning model for Protein-Ligand Interaction Prediction." *bioRxiv* (2019). *arXiv paper, not peer reviewed*.

2018 [OP.05] Z. Raziei, X. Ding*, **E.C. Larson**, M. Hahsler, P. Krueger, and E. Olinick. "Deep Convolutional Networks for Forgery Classification and Anomaly Detection." INFORMS 2018.

[OP.04] Jessica Wheeler*, Jean Jecha*, Manjula Kottegoda*, Sharon Teo*, Julie Fast and **E.C. Larson** (2018). "Bipolar Mania Eye Image Classification." SMU Data Science Review, Vol. 1. March 2018. *https://scholar.smu.edu/datasciencereview/vol1/iss1/1*

[OP.03] Karen Clark*, Mridul Jain*, Araya Messa*, Vinh Le*, and **E.C. Larson** (2018). "Open Cycle: Forecasting Ovulation for Family Planning." SMU Data Science Review, Vol. 1. March 2018. *https://scholar.smu.edu/datasciencereview/vol1/iss1/2*

[OP.02] Claire Chu*, Bill Kerneckel*, Nathan Mowat*, Christopher Woodard*, and **E.C. Larson** (2018). "Comparative Study: Reducing Cost to Manage Accessibility with Existing Data." SMU Data Science Review, Vol. 1. March 2018. *https://scholar.smu.edu/datasciencereview/vol1/iss1/5*

[OP.01] Andrew Abbott*, Alex Deshowitz*, Dennis Murray*, and **E.C. Larson** (2018). "WalkNet: A Deep Learning Approach to Improving Sidewalk Quality and Accessibility." SMU Data Science Review, Vol. 1. March 2018. *https://scholar.smu.edu/datasciencereview/vol1/iss1/7*

18. TEACHING

Teaching Awards

2020 Nominated for President's Associates Award which honors tenured faculty members who have sustained high achievement as teachers and whose scholarship makes a meaningful contribution to student learning

2016 Professor of the Year, Honoring Our Professors of Excellence (HOPE)
College-wide Award Given Annually to One SMU Professor

Courses Redesigned

CS8321 Neural Networks and Machine Learning
Lecture Course on Contemporary Research in Neural Networks including Generative Models, Transfer Learning, Neural Visualization, and Reinforcement Learning. First Offering in Spring 2019.

Teaching Format: Interactive Lectures with Demonstration Code built into Lecture Slides.

Courses Created

CS5324/7324 Machine Learning in Python
Lecture Course on Machine Learning Methods, with Emphasis on Neural Networks and Deep Learning. Uses Flipped Modules for five lectures, with emphasis on projects related to data classification and regression. Offered once every semester to accommodate demand for course. Enrollment consistently exceeds 50 students.

Teaching Format: Traditional Lecture, Live Coding Demonstrations, Live Polling, Flipped Lecture Format with In-Class Assignments

CS5323/7323 Mobile Sensing, and Learning in iOS
Lecture and Lab Course for Accessing, Processing, and Learning from Sensors on Mobile Devices. Five flipped modules with emphasis on design of iOS applications. Seven apps dues during the semester, including final project app. Usage of CoreML in iOS for local machine learning as well as RESTful API for cloud processing. Offered every other semester. Enrollment consistently stays at 24 students (maximum that lab can accommodate).

Teaching Format: Traditional Lecture, Live Coding Demonstrations, Flipped Lecture Format with In-Class Assignments

CS5325/7325 Ubiquitous Computing
Lecture Course on Human-Computer Interaction Methods for Wearables and Ubiquitous Technology. Seven flipped modules and ten lectures discussing various papers published in the field. Emphasis on creating of technology and evaluation of technology for final project. Offered every other semester. Enrollment consistently exceeds 20 students.

Teaching Format: Traditional Lecture, Student Led Paper Discussions, Flipped Lecture Format with In-Class Assignments

MSDS7331 Data Mining for Data Scientists
Flipped Lecture Format Course, Specialized for Master in Data Science. Course was created and filmed by Professor Larson, including design of all live format curriculum and projects. Emphasis on breadth of data mining concepts including visualization, regression, classification, clustering, association mining, and collaborative filtering. Twelve sections offered yearly with 10-15 students per section (with adjunct lecturers in MSDS program). One of the highest rated courses in the MSDS program.

Teaching Format: Online Format Class with Video Lectures Each Week and One Live Lecture Period, Live Coding Demonstrations, Flipped Lecture Format with In-Class Assignments (Virtual Student Groups)

Other Courses Taught at SMU

CS8098 Computer Science Seminar. Offered every semester. Serves as orientation to graduate students. Professor Larson has manipulated this course to include instruction on giving technical presentations, writing papers, and generally navigating graduate life during first three weeks of course. Remainder of course is reserved for research talks from various speakers, mostly external to SMU.

CS5331/7331 EMIS5332/7332 Introduction to Data Mining

CS7331 Data Mining, SMU-Raytheon Garland Program

Student Comments

"It was apparent and appreciated the amount of work you put into this course and your students. I can honestly say I am a little astounded in the amount I have learned from your course alone. Working …and taking courses can be tough, but I always enjoyed your lectures and if I had to watch the replay, I wasn't tempted to put it on times 2."

"*…all of the notebooks that Dr. Larson provided were incredibly helpful. He provides the best resources by far in the program. He is an accomplished coder and you can tell by the way that he explains the code as he works through the problems. His videos are extremely professional…*"

"*Eric Larson is a fantastic and gifted teacher and does not need to change anything at all about his teaching style. He is excellent at engaging the class, is knowledgeable and passionate about the subject, and willing to help students at any time outside of class*."

"*One of my favorite instructors at SMU*"

"*Professor Larson is by far one of, if not the best professor I have ever had. He is able to teach complicated topics in an extremely approachable way*."

Other Courses Offered at Outside Universities	**CSS457 Multimedia and Signal Computing** (UW Bothell) **EE518 Advanced Digital Signal Processing** (UW Seattle) Lecturer for Recitation, Professional Master's Program **EE233 Circuit Analysis II** (UW Seattle) Lab Manager, Lecturer for Recitation **ECEN 3714 Network Analysis** (OSU Stillwater) Lab Manager, Lecturer for Recitation **ECEN 3021 Experimental Methods II** (OSU Stillwater) Lab Manager, Lecturer for Recitation

19. SERVICE

2021-2022	Ph.D. of Data Science Program Committee Member
2021-2022	Search Committee Member for Cluster Hire 21st Century Education and Technology
2019-*present*	Master of Science in Data Engineering Program Committee Oversight Member
2020-*present*	Lyle School Advisor for Data Science Major and Minor
2019-2020	Member of Data Science Oversight Committee
2019	Chair, CS Faculty Search Committee (Resulting in Two Faculty Hires)
2018	Committee Member for 10 Year Impact Award Paper in Ubiquitous Computing
2017-2021	Associate Editor for Journal of Interactive, Mobile, Wearable, and Ubiquitous Technology
2016-*present*	Member of SMU Human Subjects Board and IRB
2016	Committee Member on Taskforce to Review Lyle Engineering Senior Design
2015-2016	Program Committee Member for International Conference on Ubiquitous Computing and Best Paper Selection Committee
2014-*present*	Faculty in Charge for Computer Science Research Seminar

20. SUPERVISORY COMMITTEE MEMBER (MS AND PHD, *NOT CHAIR, MEMBER ONLY*)

2022	[CM.15]	Li, Z., Dissertation Committee Member, CIVIL AND ENVIRONMENTAL ENGINEERING Department, "EQUITY OF URBAN NEIGHBORHOOD INFRASTRUCTURE: A DATA-DRIVEN ASSESSMENT", Completed. (April 2022).
2021	[CM.14]	Badi, M., Dissertation Committee Member, ENGINEERING-ELECTRICAL ENGINEERING Department, "CHARACTERIZATION OF UAV-BASED WIRELESS CHANNELS WITH DIVERSE ANTENNA CONFIGURATIONS". (November 2021).
	[CM.13]	Zhang, X., Dissertation Committee Member, ENGINEERING-ELECTRICAL ENGINEERING Department, "CONTEXT-AWARE SENSING AND FUSION FOR STRUCTURAL HEALTH MONITORING AND NIGHT TIME INTELLIGENT TRANSPORTATION SYSTEM", Completed. (January 2021).
	[CM.12]	Taylor, M., Dissertation Committee Member, ENGINEERING-ELECTRICAL ENGINEERING Department, "ENHANCED SECURITY UTILIZING SIDE CHANNEL DATA ANALYSIS", Completed. (November 2021).
	[CM.11]	Verma, N., Dissertation Committee Member, DEDMAN-CHEMISTRY Department, "APPLICATION OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN CHEMISTRY", Completed. (June 2021).

2020 [CM.09] Ouellette, M., Dissertation Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "ENHANCING AGE-RELATED MACULAR DEGENERATION OCT IMAGE GRADING BY INTEGRATING CROWDSOURCE-BASED PROBABILITY MAP INPUTS INTO DEEP NEURAL NETWORKS", Proposal. (December 10, 2020).

[CM.08] Ellington, W. L., Master's Thesis Committee Member, "HEURISTIC-BASED THREAT ANALYSIS OF REGISTER-TRANSFER-LEVEL HARDWARE DESIGNS". (August 2020).

2017 [CM.07] Taylor, M., Master's Thesis Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "RANSOMWARE DETECTION USING MACHINE LEARNING AND PHYSICAL SENSOR DATA", Completed. (December 16, 2017).

[CM.06] Thainiam, P., Dissertation Committee Member, ENGINEERING-ENGINEERING MANAGEMENT INFO & SYSTEMS Department, "LOCAL SEARCH STRATEGIES FOR THE SERIATION PROBLEM", Completed. (January 1, 2017 - May 20, 2017).

[CM.05] McCarthy, A., Master's Thesis Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "GRIDLOCK IN NETWORKS: THE LEXIMIN METHOD FOR HIERARCHICAL COMMUNITY DETECTION", Completed. (May 20, 2017).

[CM.04] Alhelahy, S., Dissertation Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "DETECTING A TROJAN DIE IN THREE-DIMENSIONAL STACKED INTEGRATED CIRCUITS", Completed. (April 20, 2017).

2016 [CM.03] Shaiba, H., Dissertation Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "MACHINE LEARNING METHODS FOR TROPICAL CYCLONE'S INTENSITY PREDICTION: ACCOUNTING FOR RAPID INTENSIFICATION EVENTS". (May 14, 2016).

2015 [CM.02] Drew, J., Dissertation Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "MULTICORE MACHINE LEARNING FOR BIG DATA APPLICATIONS IN BIOINFORMATICS AND CYBERCRIME". (November 1, 2015).

2013 [CM.01] Nagar, A., Dissertation Committee Member, ENGINEERING-COMPUTER SCIENCE AND ENGINEERING Department, "A QUASI-ALIGNMENT BASED FRAMEWORK FOR FAST DISCOVERY OF CONSERVED REGIONS AND CLASSIFICATION OF DNA FRAGMENTS", Completed. (September 1, 2013 - November 30, 2013).