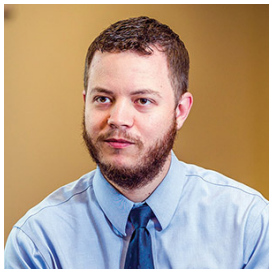

Eric C. Larson

Southern Methodist University
Bobby B. Lyle School of Engineering
Computer Science & Engineering
Dallas, TX 75205
eclarson@smu.edu
http://eclarson.com

1. RESEARCH VISION

My research explores the interdisciplinary relationship of machine learning and signal/image processing with the fields of security, mobile health, education, psycho-visual psychology, human-computer interaction, and ubiquitous computing. Like most academics, I have a passion for teaching and mentoring, and I view research as an ideal opportunity to instruct the next generation of computer scientists and engineers. I have positioned myself (with plenty of help from others) in a unique role, supporting cyber-security, education, healthcare, and sustainability applications via the integration of machine learning and ubiquitous sensing. I have become increasingly interested in sensing markers of health and context awareness using commonplace sensors. My research supports many healthcare, educational, and security initiatives by creating applications that (1) manage and diagnose many chronic/infectious ailments, (2) help learners master educational topics, and (3) investigate information leakage in pervasive and mobile devices.

2. RESEARCH INTERESTS

- Machine Learning and Deep Learning [*Sponsored*]
- Cyber Security, Mobile Sensor Data Leakage [*Sponsored*], Counterfeit Detection [*Sponsored*]
- Context Aware Computing/Learning in Man-Machine Interfaces [*Sponsored*]
- Mobile Health Computing [*Sponsored*]
- Target-Ligand Virtual Screening

3. EDUCATION

2013 **Ph.D. in Electrical Engineering**, University of Washington, Seattle
Area: Signal Processing and Ubiquitous Computing;
Advisor: Dr. Shwetak Patel Co-Advisor: Dr. Les Atlas
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
Committee: Dr. Keith Teague, Dr. Gary Yen, Dr. Qi Cheng
Advisor: Dr. Damon Chandler
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

4. EMPLOYMENT

2013-present **Southern Methodist University**, Dallas, TX
Assistant Professor

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

5. POST-DOCTORAL RESEARCHERS

Feb. 2017- Feb. 2018	**Pavel Klimovich**, *Cheminformatics tools for Ligand Fingerprinting* *Publications*: [J.09],

6. PHD STUDENTS

Current	**Yasamin Fouzani**, Topic: *Chemical Spectral Decomposition with low-cost CMOS sensing* *Publications*: Forthcoming,
Current	**Raghuram Srinivas**, Topic: *Binding Affinity Prediction with Implicit Descriptors* *Publications*: [J.09],
Current	**Xinyi Ding**, Topic: *Machine Learning Methods for Knowledge Tracing in E-Learning* *Publications*: [J.08], [J.06],
Dec 2017	**Chatchai (Mark) Wangwiwattanna**, Dissertation: *RGB Image-based Pupillary Diameter Tracking with Deep Convolutional Neural Networks* *Publications*: [J.06], [C.24], [C.25], [C.28], *Current Position*: Professor in School of Science and Technology at UTCC, Thailand
May 2015	**Sohail Rafiqi**, Dissertation: *PupilWare: Towards Cognitive and Context Aware Computing* *Publications*: [C.24], [C.25], *Current Position*: Researcher at Google, SMU Adjunct Faculty

7. MASTERS' STUDENTS

Current	**Elena Sharp,** Topic: *Unconventional Biometrics* *Publications:* Forthcoming
Current	**Justin Ledford**, Topic: *Generative Adversarial Network Applications in Counterfeit Detection* *Publications*: Forthcoming
Current	**Ian Johnson**, Topic: *Sampling Techniques for Low Bandwidth Audio Channels* *Publications*: Forthcoming
May 2018	**Travis Siems**, Thesis: *Understanding Natural Keyboard Typing Using Convolutional Neural Networks on Mobile Sensor Data* *Publications*: Forthcoming, *Now*: Analyst at Toyota Connect
August 2016	**Spencer Kaiser**, Thesis: *Open Spirometry: portable, low-cost spirometry utilizing 3d-printed vortex whistles and smartphones* *Publications*: [B.02], [C.27], *Now*: Analyst at American Airlines

8. UNDERGRADUATE RESEARCH STUDENTS (THESIS OR ENGAGED LEARNING)

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

May 2015 **Amanda Doyle**, *Engaged Learning and Undergraduate Honors Thesis*
Honors Thesis: *Overcoming Barriers to Cervical Cancer Screening: Mobile Development*
Publications: [J.08], *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.08], *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.08]

9. HONORS AND AWARDS

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

10. EXTERNAL FUNDING AND SPONSORED RESEARCH

*__WARNING__ - This section contains technical data, export of which is restricted by the International Traffic in Arms Regulations (ITAR). Disclosure to foreign persons without prior U.S. Government approval is prohibited. Violations of these export laws and regulations are subject to severe civil and criminal penalties.

2018 [EF.08] *Restricted
Duration: May 2018—May 2019

[EF.07] *Restricted
Duration: Jun. 2018—Mar. 2019

[EF.06] *Restricted
Duration: May 2018—May 2019

2017 [EF.05] *Restricted
Duration: Sep. 2017—May. 2018

[EF.04] DigiDoc Technologies
PI: **Eric C. Larson**
Title: "Data collections and algorithmic development for blood oxygenation measurement using commodity smartphone cameras "
Duration: Jun. 2017—Jun. 2018

[EF.03] *Restricted
Duration: Sep. 2017—May. 2018

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

2015 [EF.01] National Institutes of Health (NIH), Exploratory/Developmental Bioengineering Research Grants (EBRG) [R21]
PI: James Taylor
SMU Co-PI: **Eric C. Larson**
Other Personnel: James Stout, Shwetak Patel
Title: "An evaluation of a novel technology to assess neonatal jaundice"
Duration: Apr. 2015—Mar. 2018

11. INTERNAL FUNDING

2018 [IF.05] 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 "
Duration: May 2018—Dec. 2018

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

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

2014 [IF.02] 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"
Duration: May 2014—Dec. 2014

2013 [IF.01] 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 "
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.02] **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.01] M. Stiber, B. Stiber, and **E.C. Larson** (2014). Signal Computing: Digital Signals in the Software Domain. Open Access Book. Textbook.

13. REFEREED JOURNAL PUBLICATIONS

* Refers to SMU Student Authors or SMU Post-doctoral Researchers in my Research Lab
** Refers to papers that are not yet accepted for publication

2018 [J.11] ** T. Giallanza*, T. Siems*, E. Sharp*, I. Johnson*, E. Gabrielsen*, M. Thornton, and **E.C. Larson** (2018). Keyboard Snooping via Mobile Phones: Threats of Device Arrays. *In Preparation*.

[J.10] ** X. Ding*, D. Nassehi, and **E.C. Larson**. Measuring Oxygen Saturation using Convolutional Neural Networks on Smartphones. *In Submission*.

[J.09] ** R. Srinivas*, P. Klimovich*, and **E.C. Larson**. Implicit-descriptor ligand-based virtual screening by means of collaborative filtering. *In Submission*.

[J.08] ** X. Ding*, A. Doyle*, K. Donahoo*, R. Rajgopal, E. Bing, and **E.C. Larson**. EduAware: Using Tablet-Based Navigation Gestures to Predict Learning Module Performance. *In Submission*.

[J.07] ** 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. *In Submission*.

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).

[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.

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.

[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.

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

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.

14. REFEREED CONFERENCE PUBLICATIONS

* Refers to SMU Student Authors or SMU Post-doctoral Researchers in my Research Lab
** Refers to papers that are not yet accepted for publication

My research is often interdisciplinary, attracting readers with various backgrounds. It is worth noting that unlike in many academic fields, premiere conferences (such as CHI, UIST, and UbiComp) are highly selective venues intended for archival papers only. These conferences exceed many IEEE journals in their selectivity, visibility, and impact. For a study of the impact of ACM conference proceedings, see *Conference Paper Selectivity and Impact* by Jilin Chen and Joseph Konstan.

2018 [C.29] ** T. Giallanza*, E. Gabrielsen*, M. Thornton, and **E.C. Larson** (2018). Task Value Calculus: Fast Adaptive Optimization of Tasks for Multi-objective Diagrams. *In Preparation*.

[C.28] ** C. Wangwiwattana*, S. Agarwal*, and **E. C. Larson** (2018). "The Effectiveness of Notification Types to Initiate Aversive Action in Writing Procrastination." *In Preparation*.

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)

[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)

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.

[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.

[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.

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)

[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)

[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)

[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

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)

[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)

[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.

[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)

[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)

[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%

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)

[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%

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, September 2009.
Nominated for Best Paper
Acceptance Rate: 12.4%

[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.

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,

[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.

[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.

[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.

[C.02] C.T. 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.

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.

15. PATENTS

2018 [P.08] **E.C. Larson**, M. Thornton, I. Johnson*, E. Gabrielsen*, and T. Siems*. Method and System for Increasing the Effective Sample Rate of a Sampled Signal. *Provisional Patent Filed*.

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.
Currently Used by 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
Currently Licensed by 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
Currently Licensed by 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.
Currently Licensed by 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.
Currently Licensed by 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.
Currently Licensed by Phin Technologies

16. OTHER PUBLICATIONS

These publications refer to publications resulting from student projects in the SMU Master of Science in Data Science, which are **internally reviewed at SMU**. While these publications represent excellent research from students, they **do not count toward scholarly citations**.

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*

17. TEACHING

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

Courses Redesigned **CSE8321 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 scheduled for Spring 2019.

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

Courses Created	**CSE5324/7324 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 **CSE5323/7323 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 **CSE5390/7390 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	**CSE8098 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. **CSE5331/7331 EMIS5332/7332 Introduction to Data Mining** **CSE7331 Data Mining, SMU-Raytheon Garland Program**

Student Comments	"…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

18. INVITED AND SELECTED TECHNICAL TALKS

2018	[V.28]	Flipping the Clinic with Mobile Machine Learning. *Dallas, TX*, IEEE/CIE Technical Symposium, March 2018
2017	[V.27]	Natural Keyboard Sensing. *Dulles, VA*. Special Presentation. December 2017.
	[V.26]	Context Aware Computing with Embedded Sensing. *Dallas, TX*. SMU Research Seminar. October 2017.
2016	[V.25]	Design and Learnability of Vortex Whistles, *Heidelberg, Germany*, UbiComp 2016, September
2015	[V.24]	PupilWare: Towards Pervasive Cognitive Load Measurement Using Commodity Devices, *Corfu, Greece* International Conference on Pervasive Technology Related to Assistive Environments 2015, July
	[V.23]	Human Activity Recognition Through IMS: The Case for Active Learning, *Dallas, TX* NSF CRI Workshop, May 1, 2015
	[V.22]	Mobile Health for the Masses, *Dallas, TX* Lyle Download Series Southern Methodist University, Mar 25, 2015
2014	[V.21]	Consumer Centered Calibration for End-Use Water Monitoring, *Austin, TX* University of Texas, Jun 3, 2014
	[V.20]	Big Data, Small Data: The Future of Sensing in Sustainability and Health, *Dallas, TX* University of Texas at Dallas, Feb 15, 2014
	[V.19]	Phone as a Sensor Technology: mHealth and Chronic Disease, *Dallas, TX* University of Texas at Arlington, Jan 31, 2014
2013	[V.18]	Mirroring Research Through Commercial Development, *Dallas, TX* Southern Methodist University, Industrial Affiliates Meeting, Nov 1, 2013 |

[V.17] Creating the Dots: Computer Science and Engineering for Good, *Dallas, TX*
Southern Methodist University, Undecided Majors Forum, Oct 2, 2013

[V.16] Mobilizing mHealth: Interdisciplinary Computer Science and Engineering, *Dallas, TX*
Southern Methodist University, CSE Seminar, Sep 11, 2013

[V.15] Semi-Supervised Training for Infrastructure Mediated Sensing: Disaggregated Hot and Cold Water Sensing With Minimal Calibration, *Seattle, WA*
Dissertation Defense, Jun 10, 2013

[V.14] BreatheSuite: A Medical Device in Your Pocket, *Seattle WA*
Global Social Entrepreneurship Competition, Mar 15, 2013

[V.13] Linear Predictive Coding, Applications and Derivation, *Indiana*
Rose Hulman Institute of Technology, Feb 23, 2013

[V.12] Indirect, Ubiquitous Sensing, *Various Universities*
Research Talk, Various Dates

2012 [V.11] Sensing for Sustainability: Disaggregated Sensing of Electricity, Water, and Gas, *Berkeley, CA*
Invited Talk, i4Energy CITRIS Fall Seminar, 2012

[V.10] SpiroSmart: Measuring Lung Function from a Mobile Phone, *Pittsburg, PA*
International Conference on Ubiquitous Computing 2012

[V.09] Indirect Water End-Use Sensing: Consumption, Disaggregation, and Feedback, *Berkeley, CA*
Invited Talk, 2012 ACEEE Hot Water Forum

[V.08] OpenCV for Ubiquitous Computing. *Seattle, WA*
Invited Lecture, CSE599 - Ubiquitous Computing

2011 [V.07] Accurate and Privacy Preserving Cough Sensing. *Beijing, China*
International Conference on Ubiquitous Computing 2011

[V.06] A longitudinal Study of Pressure in the Home, *San Francisco, CA*
International Conference on Pervasive Computing 2011

[V.05] Where Ubiquitous Computing Meets Signal Processing. *Atlanta, GA*
Invited Talk, Georgia Institute of Technology

[V.04] HeatWave: Thermal Imaging for Surface Interaction. *Vancouver, Canada*
International Conference on Human-Computer Interaction 2010

2010 [V.03] Disaggregated Water Sensing from a Single Sensor. *Berkeley, CA*
Invited Talk, 2010 ACEEE Hot Water Forum,

[V.02] Machine Learning Toolkits. *Seattle, WA*
Invited Lecture, CSE599 - Ubiquitous Computing, November

2009 [V.01] The Most Apparent Distortion: A Dual Strategy for Image Quality, *San Francisco, CA*
SPIE Image Quality and System Performance, January

19. SERVICE

2017-present	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