Rodney L. Summerscales

Department of Computing
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EDUCATION:

- *Ph.D.*, Computer Science — 2013
  Illinois Institute of Technology, Chicago, IL
- *M.S.*, Computer Science and Engineering — 2005
  Pennsylvania State University, University Park, PA
- *B.S.*, Computer Science — 1999
  Andrews University, Berrien Springs, MI

EXPERIENCE:

- *Assistant Professor*, Computing departments, Andrews University — 2018-present
- *Assistant Professor*, ECS dept., Andrews University — 2013-2018
- *Instructor*, ECS Dept., Andrews University — 2006, 2011
- *Teaching Assistant*, CS Dept., Illinois Institute of Technology — 2008-2011
- *Software Engineer*, LECO Corp, St. Joseph, MI — 2007
- *Instructor*, CSE Dept., Penn State University — 2005-2006
- *Software Engineer*, Centroid Corp, Howard, PA — 2002-2005
- *Teaching Assistant*, CSE and IST departments, Penn State University — 1999-2002

PROFESSIONAL ACTIVITIES:

Teaching:

- Andrews University
  - CPTR 125 Computer Programming with Matlab
  - CPTR 252 Application development II
  - CPTR 276 Data Structures and algorithms
  - CPTR 425 Programming Languages
  - CPTR 430 Analysis of Algorithms
  - CPTR 435 Machine Learning
  - CPTR 436 Numerical Methods and analysis
  - CPTR 437 Formal Theory of Computing
  - CPTR 487 Artificial Intelligence
  - CPTR 475 Topics: Mobile Application development
  - CPTR 475 Topics: Game Design
  - CPTR 475 Topics: Virtual Reality
  - CPTR 490 Research
  - CPTR 493 Practicum
  - HONS 497 Honors research
- Pennsylvania State University
  - CSE 103 Introduction to Programming Techniques using C++
  - CSE 297A Computer Programming for Engineers using Matlab

Service:

Internal Service

- Member of Faculty Policy and Development committee — 2018-present
- Member of committee to develop a Data Science bachelor's degree — 2017-present
- Program Coordinator for Computing/Computer Science programs — 2015-2018
- Member of Honors Council — 2015-2020
- Member of Computing Curriculum committee to develop a professional Computer Science bachelor's degree — 2013-2015
- SCIFest planning committee — 2016-2017

Pennsylvania State University

- Member of CSE Department Curriculum committee — 2005-2006

Church Service

- Member of Encounter Sabbath School music team — 2006-2008

Research/Scholarship:

Research Projects

- *Development of a portable ECL immunosensor with mobile technologies* — 2017 - present
  Working with Drs. Hyun Kwon and Padma Tadi-Uppala from Andrews University and students to develop a smartphone controlled ECL sensing device. Machine learning is used to predict concentration given a series of ECL sensor images captured by the phone.
- *BibleOL exam mode* — 2016 - present
  Working with Dr. Oliver Glanz from Andrews University and students Steven Mann, Adrian Negrea and Wol Bol Wol to modify the online Bibical language learning tool BibleOL so that it may be used for language exams.
- *Mobile application for colorimetric analysis of paper biosensors* — 2015 - 2016
  Working with Dr. Hyun Kwon from Andrews University and honors student Eui Bin You to develop a mobile application the uses a mobile phone camera to perform colorimetric analysis of a paper biosensor.
- *Architectural visualization using virtual reality* — 2014 - 2015
  Mentored Andrews University honors student Bernardo Martinez on a project that used the Oculus Rift headset to create virtual reality walkthroughs of buildings designed by architects. This work was a collaborative effort with Professor Ariel Solis in the Andrews University School of Architecture.
- *Automatic summarization for health economics* — 2013 – 2014
  Collaborating with Dr. Karen Fitzner of DePaul University to adapt the automatic summarization system ACRES for use in the field of health economics.
- *Automatic summarization of clinical research* — 2007 – present
  Developed ACRES, a natural language processing system that automatically extracts key trial information from abstracts reporting results from clinical trials and produces summaries for evidence-based medicine. This system was developed in collaboration with Dr. Shlomo Argamon from IIT CS department and faculty from the University of Illinois at Chicago medical center.

- *3-D texture classification* 2001 – 2005
  Developed a novel method for classifying texture in 3-D (volumetric) images. Worked with Dr. Dennis Dunn from Penn State University CSE Dept.
- *Rare earth element parameterizations* 1999
  Studied some of the properties of various rare earth elements with Dr. Gary Burdick from Andrews University Physics Dept.
- *Edge detection in sonograms* 1999
  Investigated the use of Pulse-Coupled Neural Nets for edge detection in heart sonograms with Dr. James Wolfer from Andrews University CS Dept.

External Grants

- *RUI:Development of a portable ECL immunosensor with mobile technologies*. July 2017 – June 2020
  NSF grant with Drs. Hyun Kwon and Padma Tadi Uppala. ($249,198)

Internal Grants

- *Making Biblical Hebrew students learn the Hebrew Language – not the Hebrew Bible.* May 2019 – April 2021
  Joint Andrews University Faculty Research Grant with Dr. Oliver Glanz ($10000)
- *Making Biblical Hebrew students learn the Hebrew Language – not the Hebrew Bible.* May 2018 – April 2019
  Joint Andrews University Faculty Research Grant with Dr. Oliver Glanz ($6000)
- *Making Biblical Hebrew students learn the Hebrew Language – not the Hebrew Bible.* May 2017 – April 2018
  Joint Andrews University Faculty Research Grant with Dr. Oliver Glanz ($6000)
- *Making Biblical Hebrew students learn the Hebrew Language – not the Hebrew Bible.* May 2016 – April 2017
  Joint Andrews University Faculty Research Grant with Dr. Oliver Glanz ($10,000)
- *Paper biosensors and mobile apps for affordable detection of cancer biomarkers*. May 2015 – April 2016
  Joint Andrews University Faculty Research Grant with Dr. Hyun Kwon. ($10,000)

Mentored Student Projects

- Advising Jonathan Swerdlow on an NSF funded project with Dr. Hyun Kwon and Dr. Padma Tadi Uppala. This project involves developing a mobile app to capture a series of images that records the reaction from an electrochemiluminescent biosensor. It also involves developing computer vision and machine learning approaches for predicting concentration. Fall 2017 - present
- Advising John-Luke Navarro on his senior honors project. This project involved developing a web crawler to crawl the TOR network. This was work he did at Argon National Laboratory over the summer of 2017. Fall 2017 - Fall 2018
- Advising Steven Mann on his senior honors project. This project involves developing a deep learning neural net approach for extracting outcome mentions from abstracts of clinical trial reports. Fall 2015 - present
- Advising Eui Bin You on his senior honors project. The project involves developing a mobile application that performs colorimetric analysis of paper biosensors developed by Dr. Hyun Kwon. Spring 2015 - Spring 2016
- Advising Bernardo Martinez on his senior honors project. The project involves developing an application to provide immersive visualizations of architectural designs using the Oculus Rift VR headset. Fall 2014 – Fall 2015

Internal Talks

- *Improving Biblical Language Teaching and Learning with BibleOL* (with Oliver Glanz). Andrews University Celebration of Research, Oct 25, 2019. 2019

- *Development of Cell Phone Based ECL Sensor* (with Hyun Kwon and Elmer Rivera). Andrews University Celebration of Research, Oct 26, 2018. 2018
- *Improving Biblical Language Teaching and Learning with BibleOL* (with Oliver Glanz). Andrews University Celebration of Research, Oct 26, 2018. 2018
- *Interdisciplinary Health Science Research* (with Hyun Kwon and Padma Uppala) Presentation at Faculty Institute, August 16, 2018. 2018
- *Surveying the virtual landscape*, Plenary talk. Andrews University Research Conference, May 17-21, 2017 2017
- *Informatics in biology and medicine*, Guest lecture for BIOL/CHEM 120 Introduction to Biotechnology, Andrews University, March 3, 2016 and March 9, 2017. 2016, 2017
- *Automatic summarization of clinical abstracts for evidence-based medicine*, Andrews University Research Conference, May 7-11, 2014 2014
- *Automatic summarization of clinical abstracts for evidence-based medicine*, Andrews University Coding Club, November 22, 2013 2013
- *Patterns of Light: Analyzing 2-D and 3-D Image Texture*, Andrews University ECS Dept., assembly, March 7, 2006 2006

Outreach Poster Presentations

- *Machine Learning assisted ECL sensor analysis*, Andrews University Celebration of Research, Oct. 25, 2019 2019
- *Mobile application for colorimetric analysis of paper biosensors*, Andrews University Celebration of Research, Oct. 30, 2015 2015
- *Using Evidence-based medicine summaries to help answer health economic questions,* Andrews University Celebration of Research, Oct. 31, 2014 2014
- *Automatic summarization of results from clinical abstracts,* Andrews University Celebration of Research, Nov. 1, 2013 2013
- *Automatic summarization of results from clinical abstracts,* IIT Research day, April 24, 2013 2013
- *Automatic summarization of results from clinical abstracts,* IIT Computer Science reunion student poster session, Oct. 29, 2012 2012
- *Automatic summarization of results from clinical abstracts,* ARCS Chicago Annual Scholar Awards Luncheon, Oct. 25, 2012 2012
- *Automatic summarization of results from clinical abstracts,* ARCS Chicago Annual Scholar Awards Luncheon, Oct. 26, 2011 2011

Conference Presentations

- Elmer Alberto Ccopa Rivera, Jonathan Swerdlow, Adriano Pinto Mariano, Mabio Ramos Coelho Neto, **Rodney Summerscales**, Padma Uppala and Hyun Kwon. “ILLUPHENS: Smartphone-based electrochemiluminescence sensor to monitor phenolic compounds in wastewater from biofuel plants.” *42nd Symposium on Biomaterials, Fuels and Chemicals (SBFC) New Orleans, LA*. April 26-29, 2020.
- Hyun J. Kwon, Elmer Ccopa Rivera, Mabio R.C. Neto, Jonathan J. Swerdlow, **Rodney L. Summerscales**, and Padma P. Tadi Uppala. "Cancer Biomarker Detection Using the Smartphone Based ECL Immunosensor." Biomedical Engineering Society Annual Meeting. Philadelphia, PA. October 17-19, 2019.
- Jonathan Swerdlow, **Rodney Summerscales** and Hyun Kwon. "Developing a mobile application for electrochemiluminescent biosensor control and analysis." Michigan Academy of Science, Arts and Letters. Alma College, Alma, MI. March 1, 2019.

- Jeremy Barrett, Carlos Germosen, Daniel Marsh, Daniel Marsh, Jonathan Swerdlow, **Rodney Summerscales**, Elmer Rivera and Hyun Kwon. "Mobile phone based ECL sensor for dopamine detection." Michigan Academy of Science, Arts and Letters. Alma College, Alma, MI. March 1, 2019.
- Hyun Kwon, Padma P. Tadi Uppala, Elmer Ccopa Rivera, **Rodney Summerscales**. "Development of a cell phone-based electrochemiluminescence biosensor to detect breast cancer biomarkers." *American Association for Cancer Research annual meeting (AACR Annual Meeting 2019)*. Atlanta, GA. April 1, 2019.
- K.A. Fitzner, **R.L. Summerscales**, S.E. Argamon, J.M. McKoy, "Can information contained in Evidence-Based Medicine Summaries Help Answer Health Economic Questions?", At *5th Biennial Conference of the American Society of Health Economists (ASHEcon 2014)*, June 23, 2014.

Publications

- E. C. Rivera, **R. L. Summerscales**, P. P. Tadi Uppala, and H. J. Kwon, "Electrochemiluminescence Mechanisms Investigated with Smartphone-Based Sensor Data Modeling, Parameter Estimation and Sensitivity Analysis," *ChemistryOpen*, vol. 9, no. 8, pp. 854–863, Aug. 2020.
- E.C. Rivera, J.J. Swerdlow**, R.L. Summerscales**, P.P. Tadi Uppala, R.M. Filho, M.R.C. Neto, H.J. Kwon. "Data-Driven Modeling of Smartphone-Based Electrochemiluminescence Sensor Data using Artificial Intelligence." *Sensors* 2020, 20, 625.
- H.J. Kwon, E.C. Rivera, M.R.C. Neto, D. Marsh, J.J. Swerdlow, **R L. Summerscales**, P.P. Tadi Uppala. "Development of smartphone-based ECL sensor for dopamine detection: Practical approaches." Results in Chemistry. 2020.
- **R.L. Summerscales**, "Automatic summarization of clinical abstracts for evidence-based medicine," Ph.D. Thesis, Illinois Institute of Technology, 2013.
- **R.L. Summerscales**, S. Argamon, S. Bai, J. Hupert, and A. Schwartz. "Automatic summarization of results from clinical trials". In *Proceedings of the 2011 IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2011)*, 2011.
- **R.L. Summerscales**, S. Argamon, J. Hupert, A. Schwartz. "Identifying Treatments, Groups, and Outcomes in Medical Abstracts," *The Sixth Midwest Computational Linguistics Colloquium (MCLC 2009)*, 2009.
- **R.L. Summerscales**, "Three-Dimensional Texture Classification using the Discrete Cosine Transform," M.S. Thesis, Pennsylvania State University, 2005.
- G.W. Burdick, R.D. Robertson, **R.L. Summerscales**, "Electric-Dipole $4f^N$-$4f^N$ transition intensity parametrizations for lanthanides: an examination of local minima," *Journal of Alloys & Compounds*. v323-324, July 2001:778-782.
- G.W. Burdick, **R.L. Summerscales**, S.M. Crooks, M.F. Reid, F.S. Richardson, "Electric-Dipole $4f^N$-$4f^N$ transition intensity parametrizations for lanthanides: multiple indistinguishable parameter sets and multiple local minima," *Journal of Alloys & Compounds*. v303, May 2000:376-382, 2000.
- J. Wolfer, S.H. Lee, J. Sandelski, **R. Summerscales**, J. Soble, J. Roberge, "Endocardial Border detection in contrast enhanced echocardiographic cineloops using a pulse coupled neural network," *1999 Computers in Cardiology*; 26:185-188, 1999.