Matthew L. Dering

Contact Information

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Research Interests

Deep Learning, Convolutional Neural Networks, Human Dynamics and Behavior, Product Design, Computer Vision, Automated Content Generation.

Education

Penn State University, University Park, PA

Ph.D., Computer Science and Engineering, *Expected:* December 2017

- Thesis Topic: *Using Deep Learning To Provide Computer Aided Design in Physical Spaces*
- Advisors: Conrad S. Tucker, Ph.D and Daniel Kifer, Ph.D

M.S., Computer Science And Engineering, March 2014

- Topic: *Android Market: Large Scale Reconstruction and Analysis*
- Advisor: Patrick McDaniel, Ph.D

Swarthmore College, Swarthmore, PA

B.A., Psychology June 2007

Research Experience

Research Assistant — July 2014 to present
Penn State DATALab,
Penn State University
Supervisor: Conrad S. Tucker, Ph.D

Summer Researcher — Summer 2015
Air Force Institute of Technology,
Dayton, OH
Supervisor: Kenneth Hopkinson, Ph.D

Research Assistant — June 2012 to May 2014
SIISLab,
Penn State University
Supervisor: Patrick McDaniel, Ph.D

Summer Student — Summer 2012
MIT Lincoln Labs,
Lexington, MA
Supervisor: Thomas Moyer, Ph.D

Refereed Publications

1. **Dering, M. L.**, Tucker, C. S., and Kumara, S. "An Unsupervised Machine Learning Approach To Assessing Designer Performance During Physical Prototyping" *Journal of Computing and Information Science in Engineering*, 2017.

2. **Dering, M. L.** and Tucker, C. S. "A Convolutional Neural Network Model for Predicting a Products Function, Given Its Form" *Journal of Mechanical Design: Data Driven Design*, 2017.

3. **Dering, M. L.** and Tucker, C. S. "Early Predicting of Student Struggles Using Body Language" *ASEE Annual Conference & Exposition*, 2017.

4. Bodnar, T., **Dering, M. L.**, Tucker, C., and Hopkinson, K. M. "Using Large-Scale Social Media Networks as a Scalable Sensing System for Modeling Real-Time Energy Utilization Patterns." *IEEE Transactions on Systems, Man, and Cybernetics: Systems.*, PP (99):1–14, 2016.

5. Octeau, D., Jha, S., **Dering, M.**, McDaniel, P., Bartel, A., Li, L., Klein, J. and Le Traon, Y. "Combining static analysis with probabilistic models to enable market-scale android inter-component analysis." *ACM SIGPLAN Notices* 51(1):469–484, 2016.

6. **Dering, M. L.**, and Tucker, C. S. (2015, August). "A Computer Vision Approach for Automatically Mining and Classifying End of Life Products and Components." *2015 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference* V004T05A007–V004T05A007.

7. Octeau, D., Luchaup, D., **Dering, M.**, Jha, S., and McDaniel, P. "Composite constant propagation: Application to android inter-component communication analysis." *Proceedings of the 37th International Conference on Software Engineering* 1:77–88, 2015.

8. **Dering, M. L.**, and McDaniel, P. "Android market reconstruction and analysis." *Military Communications Conference (MILCOM)*, 2014:300–305.

Submitted Conference Publications

1. **Dering, M. L.** and Tucker, C. S. "The En-GAN-eer and I" *AAAI Fall Symposium*, 2017.

Papers in Preparation

1. **Dering, M. L.** and Tucker, C. S. "Dis-Kinect-ed: Using Deep Learning for Simultaneous Pose and Depth Estimation".

Teaching Experience

Teaching Assistant — Fall 2014–Spring 2015
CMPSC 201 - Introduction to Programming for Engineers
Instructor: Martin Yeh, Ph.D
Computer Science and Engineering,
Penn State University

Hardware and Software Skills

Programming Languages:
- Python, C, C++, Java, Ruby, SQL, MySQL, Matlab, and others

Software:
- Scikit-learn, Tensorflow, Theano, (Py)Torch, Matplotlib, Opencv, PCL, Boost, D3 and many others

Skills:
- Data Science, Robotics, Image Processing, Artificial Intelligence, Text Analysis, Visualization, Time Series Analysis.