Michael A. Cogswell

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GOAL

I want to understand intelligence by creating it with computers and mathematics. I focus broadly on Deep Learning with applications to Computer Vision.

EDUCATION

B.S., Computer Science, Honors Scholar, Dec. 2013, **Virginia Tech**, Blacksburg, VA
GPA (overall): 3.77/4.0 GPA (in major): 3.76/4.0
B.S., Mathematics, Honors Scholar, Dec. 2013, **Virginia Tech**, Blacksburg, VA
GPA (overall): 3.77/4.0 GPA (in major): 3.70/4.0
M.S., Computer Science, Mar. 2016, **Virginia Tech**, Blacksburg, VA
GPA (overall): 3.74/4.0
Ph.D., Electrical and Computer Engineering, Started Fall 2015, **Virginia Tech**, Blacksburg, VA

COMPUTER SKILLS

Proficiencies: Python Linux Caffe (Deep Learning)
Familiarities: Deep Learning (Keras / Tensorflow / Chainer / Torch 7) d3.js C/C++ scikit-learn Matlab Java

RELEVANT CLASSES

Intro Machine Learning	Intro Computer Vision	Numerical Optimization	Combinatorics
Probabilistic Graphical Models	Abstract Algebra	Theory of Algorithms	Numerical Method
Deep Learning	Intro Artificial Intelligence	Optimization for High Dimensional Data	

EXPERIENCE

Microsoft Research Cambridge, Cambridge, England Summer 2016.
Research project involving automated conversational agents.

Graduate Research Assistant, Blacksburg, VA Summer 2014-Summer 2015; August 2015 - Spring 2016.
Pursue research combining Convolutional Networks and Computer Vision

- Applied Convolutional Networks to Semantic Segmentation
- Added GPU capability to/maintained compute cluster
- Pursuing other research projects with Convolutional Neural Networks

Machine Learning Summer School, Kyoto, Japan August 23, 2015 - September 4, 2015
Obtained a broad view of Machine Learning through lectures delivered by a diverse set of experts

Photokharma, Blacksburg, VA July 2015 - August 2015
Research intern developing face recognition software with deep Learning

- Review potentially relevant literature and
- Implemented cascade of Convolutional Neural Networks

Blackwatch International, Rockville, MD Summer 2013
Intern for IED Detection Team

- Created a protype radar imagery analysis module.

IBM, Raleigh, NC Summer and Fall 2012
Intern for Data Analytics Team

- Developed machine learning features and visualizations.

Coast Guard Operations Systems Center, Kearneysville, WV Summer 2010 and 2011
Intern for the Managed Services Team
- Generated reports using IBM Cognos 8, web development, scripting, various assignments.

Undergraduate Research: Removing Compile Time Dependencies for Testing Fall 2010
Supervised by Dr. Stephen Edwards
- Rewrote Java bytecode to enable differing implementations of a program to compile.

Accurate Systems, Shepherdstown, WV Summer 2009
Intern
- Fixed computers and installed a Joomla server.

FUNDING / EXTRA-CURRICULAR ACTIVITIES

Bradley Fellowship, Tuition + $36,000 stipend for 3 years, sponsored by VT ECE dept, starting in Fall 2015
Fencing Service, Elected Armorer, Treasurer, Vice President (2x) *Fencing Accomplishments*, Taught beginning fencing lessons Fall 2015, MVP of the VT Fencing Club, rated C2014
Pi Mu Epsilon, Member, National Mathematics Honorary Society
Upsilon Pi Epsilon, Member, International Honor Society for Computing and Information Disciplines
Phi Beta Kappa, Member, Honor Society
Scholarships, Pratt Engineering Scholarship, $5000, 2009-2010; AFCEA NOVA Scholarship, $4000; Gilbert L & Lucille C Seay Scholarship, $2000, 2010-2011; Computer Science Resource Consortium Scholarship, $1500, 2011-2012, 2013-2014
International Science Fair (High School) Participated with the project titled *Is a Multiply with Carry pseudo random number generator statistically more random than a Combined Linear Congruential pseudo random number generator?*

PUBLICATIONS

[1] Lee, S., Purushwalkam, S., Cogswell, M., Ranjan, V., Crandall, D., and Batra, D. Stochastic multiple choice learning for training diverse deep ensembles. In *NIPS* (2016) Similar to M Best Heads paper.

[2] Cogswell, M., Ahmed, F., Girshick, R., Zitnick, L., and Batra, D. Reducing overfitting in deep networks by decorrelating representations. *Proceedings of the International Conference on Learning Representations (ICLR)* (2016)

[3] Edwards, S. H., Shams, Z., Cogswell, M., and Senkbeil, R. C. Running students' software tests against each others' code: new life for an old gimmick. In *Proceedings of the 43rd ACM technical symposium on Computer Science Education* (2012), ACM, pp. 221–226

OTHER WORKS

[1] Cogswell, M., Lin, X., Purushwalkam, S., and Batra, D. Combining the best of graphical models and convnets for semantic segmentation. *arXiv preprint arXiv:1412.4313* (2014) An earlier version appeared at the CVPR 2014 Scene UNderstanding Workshop.

[2] Lee, S., Purushwalkam, S., Cogswell, M., Crandall, D., and Batra, D. Why m heads are better than one: Training a diverse ensemble of deep networks. *arXiv preprint arXiv:1511.06314* (2015)