

# AHMED HEFNY

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## CAREER OBJECTIVE

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Participating in computer research and development, especially in artificial intelligence and machine learning fields, and working in an environment that provides continuous motivation for problem solving and knowledge expansion.

## EDUCATION

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**Carnegie Mellon University** *May 2018*

Doctor of Philosophy in Machine Learning (GPA: 4.13)

Thesis: Efficient Methods for Prediction and Control in Partially Observable Environments

**Carnegie Mellon University** *May 2015*

Master of Science in Machine Learning

Project: A New View of Predictive State Methods for Dynamical System Learning

**Cairo University** *May 2010*

Master of Science in Computer Engineering

Distinction 95.3% (3.83 GPA)

Ranking 1st

Thesis: Error Rate Estimation for Small Sample Sized Problems

**Cairo University** *May 2007*

Bachelor of Science in Computer Engineering

Distinction with honors 95.5% (3.96 GPA)

Ranking 1st out of 105

Graduation Project: Machine Learning for Capture the Flag Games (AIIDE 2008)

## WORK EXPERIENCE

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**Waymo** July 2018 - to date

*Software Engineer* *Mountain View, CA*

- Working on behavior prediction for the self-driving car.

**Google[X]** May 2015 - August 2015

*Software Engineering Intern* *Mountain View, CA*

- Worked on behavior prediction for the self-driving car.

**Google** May 2014 - August 2014

*Software Engineering Intern* *Mountain View, CA*

- Developed statistical models, inference algorithms and utilities for user modeling.

**Bing/Microsoft Research** Summer 2013

*Research Intern* *Bellevue, WA*

- Worked on a joint Bing/MSR project for analyzing and enhancing Bing notifications.

**Bing/Microsoft Research** Summer 2012

*Research Intern* *Bellevue, WA*

- Worked with Bing's Document Understanding Team on extracting facts from documents.

**Microsoft Advanced Technology Lab in Cairo (ATLC)** 2010-2011  
*Research Assistant* Cairo, Egypt

- Worked on Arabic named entity recognition and multilingual information retrieval.

**IBM Cairo Technology Development Center (CTDC)** 2007-2010  
*R&D Engineer* Cairo, Egypt

- Worked on statistical parsing, Arabic document summarization and machine translation.

**University of Wuerzburg** Summer 2006  
*Intern* Wuerzburg, Germany

- Worked with a research group in the field of Computer-aided Neuro-rehabilitation. Developed a virtual reality based hand motion training and analysis system using Java. The work was presented later at the 82nd Annual Congress of the German Society of Neurology.

**HPROG** 2005  
*Part-time Developer* Cairo, Egypt

- Developed an O/R mapping tool that maps SQL Server 2000 tables to Visual Basic.NET classes.

## TEACHING EXPERIENCE

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**Carnegie Mellon University** Fall 2013 and Spring 2015  
*Teaching Assistant* Pittsburgh, PA

- Taught MSc and PhD-level introductory courses on machine learning.
- Teaching efforts included preparing and giving recitations, designing and grading homework and exam problems, maintaining course websites and developing a web interface to display lecture videos synchronized with slides.

**Cairo University** 2007-2011  
*Teaching Assistant* Cairo, Egypt

- Taught courses on Data Structures and Algorithms, Algorithm Design and Analysis, Neural Networks, Artificial Intelligence, Computer Graphics and Embedded Systems.
- Teaching efforts included preparing recitation and lab materials, giving recitations and labs, designing and grading course projects and homework problems, setting-up automatic grading platforms and maintaining course websites.

## PUBLICATIONS

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- Ahmed Hefny\*, Zita Marinho\*, Wen Sun, Siddhartha Srinivasa and Geoffrey Gordon, “Recurrent Predictive State Policy Networks”, ICML 2018.
- Ahmed Hefny, Carlton Downey and Geoffrey Gordon, “An Efficient, Expressive and Local Minima-free Method for Learning Controlled Dynamical Systems”, AAAI 2018.
- Carlton Downey, Ahmed Hefny, Boyue Li, Byron Boots and Geoffrey Gordon, “ Predictive State Recurrent Neural Networks”, NIPS 2017.
- Ahmed Hefny, Zita Marinho, Carlton Downey, Wen Sun, Siddhartha Srinivasa and Geoffrey Gordon, “Predictive State Models for Prediction and Control in Partially Observable Environments”. CoRL 2017.
- Ahmed Hefny, Diane Needell and Aaditya Ramdas, “Rows vs. Columns: Randomized Kaczmarz or Gauss-Seidel for Ridge Regression”, SIAM Journal of Scientific Computing, 2017.

- Sashank J. Reddi, Ahmed Hefny, Suvrit Sra, Barnabs Pczos and Alexander Smola, “Stochastic Variance Reduction for Nonconvex Optimization”, ICML 2016.
- Ahmed Hefny, Carlton Downey and Geoffrey Gordon, “Supervised Learning for Dynamical System Learning”, NIPS 2015.
- Sashank J. Reddi, Ahmed Hefny, Suvrit Sra, Barnabs Pczos and Alexander Smola, “On Variance Reduction in Stochastic Gradient Descent and its Asynchronous Variants”, NIPS 2015.
- Sashank Reddi\*, Ahmed Hefny\*, Carlton Downey, Avinava Dubey, Suvrit Sra, “Large-scale randomized-coordinate descent methods with non-separable linear constraints”, UAI 2015 [**\*co-first authors**].
- A. Hefny, G. Gordon, R. Kass, S. Khanna and M. Smith, “Fast and Improved SLEX Analysis of High-dimensional Time Series” , NIPS 2014 Workshop on Machine Learning and Interpretation in Neuroimaging.
- Ahmed Hefny, Sashank Reddi and Suvrit Sra, “Coordinate Descent Algorithms With Coupling Constraints: Lessons Learned”, NIPS 2014 Workshop on Software Engineering for Machine Learning [**spotlight presentation**].
- A. Hefny, G. Gordon, and K. Sycara, “Random walk features for network-aware topic models”. NIPS Workshop on Frontiers of Network Analysis: Methods, Models, and Applications, 2013.
- Avinava Dubey, Ahmed Hefny, Sinead Williamson and Eric P. Xing, “A non- parametric mixture model for topic modeling over time”, SDM 2013.
- Ahmed Hefny, Kareem Darwish and Ali Alkahky, “Is a Query Worth Translating: Ask the Users!”, ECIR 2011.
- Ahmed Hefny, Hany Hassan and Mohamed Bahgat, “Incremental Combinatory Categorical Grammar and its Derivations”, CICLING 2011.
- Ahmed Hefny and Amir Atiya, “A New Monte Carlo-based Error Rate Estimator”, ANNPR 2010.
- Gentner, R.; Hefny, A.; Farhan, W.; Segor, F.; Dees, D.; nal, C. and Classen, J. “A novel virtual reality based finger movement training system to investigate mechanisms of training induced plasticity”. Presented at the 82nd Annual Congress of the German Society of Neurology (DGN), 2009.
- A. Madkour, T. Hefni, A. Hefny and K. S. Refaat, “Using Semantic Features to Detect Spamming in Social Bookmarking Systems”, ECML PKDD Discovery Challenge, 2008.
- Ahmed S. Hefny, Ayat A. Hatem, Mahmoud M. Shalaby and Amir F. Atiya, “Cerberus: Applying Supervised and Reinforcement Learning Techniques to Capture the Flag Games”, AIIDE 2008.

## PROFESSIONAL AND GENERAL ACTIVITIES

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- 2010-** Program committee member for Conference on Neural Information Processing Systems 2018 (NIPS), International Conference on Artificial Intelligence and Statistics AISTATS 2016-2018, International Joint Conference on Neural Networks IJCNN 2010 (IEEE) and International Conference on Intelligent System Design and Application ISDA 2010 (IEEE).  
Reviewer for PLOS One, Journal of Computational Neuroscience, Pattern Recognition (Elsevier), Journal of Machine Translation Special issue on Machine Translation for Arabic (Springer), Pattern Recognition Letters (Elsevier).
- 2015** Participated in the first Neurohackathon hosted by CMU’s BrainHub. Our team won the first place.

- 2008-2010** Proceedings editor for International Computer Engineering Conference (ICENCO).
- Spring 2007** Participated in “Imagine Cup 2007” software design competition sponsored by Microsoft. Round 2 finalist.
- 2001-2002** Member in IEARN international student cultural program. Participated in Youth-CAN 2001 conference.

## SELECTED COURSES

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- Fall 2016** Topics in Deep Learning course at CMU.  
Course Project: Comparing LSTM recurrent networks to feed forward networks with predictive states.
- Summer 2016** Control of Mobile Robots course at GeorgiaTech (through Coursera)
- Spring 2014** Randomized Algorithms and Advanced Optimization course at CMU.  
Course project: Randomized Coordinate Descent Methods with Non-Separable Linear Constraints.
- Fall 2012** Optimization course at CMU.  
Course project: A hybrid transition and graph-based parser using linear programming.
- Spring 2012** Graduate Algorithms course at CMU.  
Statistical Machine Learning course at CMU.
- Fall 2011** Machine Learning course at CMU.  
Course Project: Parametric and non-parametric topic models with time.
- April 2009** Intel Multicore Programming Course (Training for Trainers).

## TECHNICAL SKILLS

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Strong/Very Good Experience

- C/C++, Java, C#
- Python (with NumPy), MATLAB, OpenMP, OpenGL, Theano
- Unix Command-line Tools, SVN, Git, Emacs, Latex

Exposure

- TensorFlow, PyTorch
- MPI, MapReduce, zeroc, zeromq
- Vim

## LANGUAGES

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Arabic: Native Speaker.

English: Excellent written/spoken.

## **REFERENCES**

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References to be furnished upon request.