Ahmed Osman

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Education

MS | Computer Science
University of Freiburg | 2017
- Research: Computer Vision, Machine Learning
- Advisor: Thomas Brox
- Collaborators: Wojciech Samek
- GPA: 3.75 (US) - 1.6 (German)

BS | Computer & Communications Engineering
Alexandria University | 2014
- CS GPA: 3.48
- Concentration in AI/Computer Vision

Skills

Programming Languages
Proficient
Python • C • C++
Experienced
CUDA • Java • Matlab • C#

Machine Learning
Frameworks
Pytorch • Keras • Caffe
Tensorflow • Torch7
Algorithms
Attention • Autoencoders
GANs • CNNs • RNNs

Tools
Containerization
Kubernetes • Singularity • Docker
HPC
Slurm • SGE • TORQUE
OS
Linux • Mac • Windows

Languages
Fluent
English • Arabic
Basic
German • French

Related Activities

Reviews
I reviewed papers for ICML 2020, AAAI 2020, ICIP 2020, MICCAI 2019, ICASSP 2019, ACL 2019.

Fun
I run 50+ services on a 4-node multi-architecture (x86/ARM) Kubernetes cluster at home.

Experience

Fraunhofer HHI | Machine Learning Researcher
Nov. 2017 - Present
- Led and developed the communication services for a pollution forecasting project with €3.8M budget (SAUBER): including an ML API, a real-time messaging protocol, and automating the ML back-end pipeline resulting in a 24x reduction in response time.
- Create the first synthetic dataset for ***automatic*** quantitative evaluation of model interpretability methods on visual question answering (VQA) [Dataset/Code].
- Develop self-supervised attention mechanisms to improve state-of-the-art text VQA models by up to 22%.
- Implement compression methods for MobileNet reducing parameters by 51% without performance loss and winning the MPEG call for neural network compression standard.
- Conduct pilot ML experiments on the VVC MPEG video coding standard.
- Co-manage a 13-server multi-GPU cluster used by the entire ML group.

Fraunhofer HHI | Machine Learning Research Assistant
Feb. 2017 - Oct. 2017
- Developed a novel attention mechanism for multi-modal tasks (VQA) performing 9.7% better than traditional attention mechanisms .
- Demo exhibited at CEBIT18, Tagesspiegel 2018, LNDW 2018, LNDW 2019, MS Wissenschaft 2019 & ScienceStation 2019.

SRTA City - Informatics Institute | Research Assistant
Oct. 2014 - Mar. 2015
- Designed and coded a novel GPU FFT-based convolutional neural network framework, resulting in superior performance compared to other frameworks (Caffe, Torch7, Theano) for large filters.
- Developed a custom GPU-accelerated real-time object tracking & navigation system performing 13x faster than an equivalent OpenCV implementation.

IRON Labs | Full Stack Software Engineer
Sep. 2012, Nov. 2013
- Co-designed and developed a clinic management software from the ground up, including requirement analysis, software design, implementation, and testing.
- Created and executed software test units for ERP software.

Publications

Published/Accepted
- **Osman** & Samek, 2019: "Dual Recurrent Attention Units for Visual Question Answering" *CVIU Journal*
- Arras, **Osman**, Müller, & Samek, 2019: "Evaluating Recurrent Neural Network Explanations" *ACL Blackbox-NLP workshop*
- Wiedemann, Kirchhoffer, Matlage, Haase, Marban, Marinc, Neumann, **Osman**, Marpe, Schwarz, Wiegand, & Samek, 2019: "DeepCABAC: Context-adaptive binary arithmetic coding for deep neural network compression" *ICML ODML-CDNNR Workshop*

Preprints
- **Osman***, Arras* & Samek, 2020: "Towards Ground Truth Evaluation of Visual Explanations" [**code**]

Posters
- **Osman** & Samek, 2018: "Dual Recurrent Attention Units for Visual Question Answering" *CVPR VQA Workshop*