Nathan Hubens

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Education

Joint Ph.D. Student *Oct. 2018 - Now*
Faculty of Engineering of Mons (Belgium) | Telecom SudParis (France)
Neural Network compression and fake news detection.

M.Sc. of Engineering *Sep. 2016 - Jul. 2018*
Faculty of Engineering of Mons (Belgium)
Majoring in Electrical Engineering with Multimedia and Telecommunications specialization.

B.Sc. of Engineering *Sep. 2012 - Jul. 2016*
Faculty of Engineering of Mons (Belgium)
Majoring in Electrical Engineering.

Fast.ai Deep Learning course Part 1 & 2 *Oct. 2018 - Apr. 2019*
University of San Francisco (remote course)
Exploration and implementation of cutting-edge deep learning techniques.

Professional Experience

PhD Internship | *AMD* *Jan. 2022 - Now*
· Model compression and speed-up with fasterai;
· Integration of the solution on hardware.

Researcher | *Trusted AI Labs (TRAIL)* *Sep. 2021 - Now*
· Privacy preserving ML;
· Collaboration with public hospitals for solution deployment.

Master Thesis | *Creaceed* *Feb. 2018 - Jun. 2018*
· Image Super-resolution and Denoising using Deep Neural Networks;
· Model compression and speed-up;
· Integration of the solution on mobile devices (iOS).

Master Internship | *Creaceed* *Jul. 2017 - Sep. 2017*
· Exploration of deep learning techniques in the context of image processing;
· Realization of a deep neural network for image restoration tasks.
· Contribution to the Hydra iOS application.

Executive Secretary | *YEP'tech Mons* *Sep. 2015 - Jun. 2017*
· Junior Initiative providing professional experience to engineering students through projects and training;

Academic Experience

· Workshop Presentor of "FasterAI: how to create small and fast neural networks", at CUTE 2022, Mons, Belgium
· Oral Presentation of "Improve Convolutional Neural Network Pruning by Maximizing Filter Variety", at ICIAP 2022, Lecce, Italy
· Oral Presentation of "import fasterai: a Library to Make Smaller and Faster Neural Networks", at TRAIL Kickoff 2022, Faculty of Engineering of Mons, Belgium

- Lecturer of Signal Processing Exercices, UMONS, Belgium, 2021
- Oral Presentation of "Neural Network Compression in the time of Climate Challenge", at Energy4Climate Workshop 2021, Télécom SudParis, France
- Oral Presentation of "Fake-Buster: A Lightweight Solution for Deepfake Detection", at SPIE 2021, San Diego, USA
- Poster Presentation of "One-Cycle Pruning: Pruning ConvNets Under a Tight Training Budget", at SNN 2021 (remote)
- Oral Presentation of "An Experimental Study of the Impact of Pre-Training on the Pruning of a Convolutional Neural Network", at APPIS 2020, Las Palmas de Gran Canaria, Spain
- Lecturer of Multimed'IA: Deep Learning for creative applications, UMONS, Belgium, 2020 and 2021
- Oral Presentation of "Towards smaller and faster CNNs", at International ML Workshop 2019, Télécom SudParis, France

Publications

- Hubens N. et al., "One-Cycle Pruning: Pruning ConvNets Under a Tight Training Budget". In International Conference on Image Processing (ICIP), 2022.
- Hubens N. et al., "Improve Convolutional Neural Network Pruning by Maximizing Filter Variety". In Proceedings 21st International Conference on Image Analysis and Processing (ICIAP),2022.
- Delvigne V., Tits N.,La Fisca L. , Hubens N. , Maiorca A., Wannous H. , Dutoit T. , Vandeborre J.-P. "Where Is My Mind (looking at)? Predicting Visual Attention from Brain Activity". In MDPI Informatics, 2022
- Maiorca A., Hubens N., Laraba S., Dutoit T., "Towards Lightweight Neural Animation : Exploration of Neural Network Pruning in Mixture of Experts-based Animation Models". In Proceedings of the 17th International Conference on Computer Graphics Theory and Applications (GRAPP), 2022.
- Hubens N. et al., "Fake-Buster: A Lightweight Solution for Deepfake Detection". In Proceedings of SPIE Optical Engineering + Applications (SPIE), 2021.
- Hubens N. et al., "One-Cycle Pruning: Pruning ConvNets Under a Tight Training Budget". In Sparsity in Neural Networks: Advancing Understanding and Practice (SNN), 2021.
- Hubens N. et al., "An Experimental Study of the Impact of Pre-Training on the Pruning of a Convolutional Neural Network". In Proceedings of the 3rd International Conference on Applications of Intelligent Systems (APPIS), 2020.
- Delbroucq J.B., Hubens N., Maiorca A., Dupont S., "Modulated Self-attention Convolutional Network for VQA". In NeurIPS Workshop on Visually-Grounded Interaction and Language (ViGIL), 2019.

Certifications

Hands on AI | ***UMONS***

- Object Recognition and Detection;
- Reinforcement Learning.

Deep Learning Specialization | ***Coursera (MOOC)***

- Neural Networks and Deep Learning;
- Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization;
- Structuring Machine Learning Projects.

Honors & Awards

Accenture's Collaboration Prize | ***Hands on AI Hackathon***

Creation of a threat detection DNN and integration on a Raspberry Pi using an Intel Movidius.

Semi-Finalist in Step Challenge | ***La Maison de l'Entreprise***
Entrepreneurship contest for students. Finished in the top 8 out of 180+ participants.

Projects

fasterai - Author
PyTorch ⋄ fastai ⋄ Compression
fasterai is a library for PyTorch and fastai for neural network compression (9k+ downloads).

fastai - Contributor
Deep Learning ⋄ PyTorch ⋄ Python
fastai is a high-level neural networks API, written in Python.

Kaggle - Competitor
Deep Learning ⋄ Computer Vision ⋄ PyTorch
Top 2% of Kaggle competitors

Medium - Technology Writer
Deep Learning ⋄ Computer Vision
Writer for the *Towards Data Science* publication (600k+ subscribers).

Skills & Languages

- **Programming:** Python, Swift, C++, MATLAB;
- **Framework:** PyTorch, fastai, Keras, OpenCV, Pandas, Matplotlib, Numpy;
- **Language:** French (mother tongue), English (level C1), Dutch (level B2), Japanese (beginner).