Kacper Kania

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Education

Started: Oct 2019 — **PhD candidate in Machine Learning**
University: Wrocław University of Science and Technology
Thesis proposal: Mesh Reconstruction of Objects in the Scene

Feb 2018 - Jul 2019 — **Master Degree with honours in Computer Science and Data Science**
University: Wrocław University of Science and Technology
Thesis: Analysis of properties of contextual neural networks in CUDA
GPA: 5.08 / 5.50

Oct 2014 - Jan 2018 — **Bachelor Degree with honours in Computer Science**
University: Wrocław University of Science and Technology
Thesis: An implementation of an inference module in the sign language recognition system
GPA: 4.79 / 5.50

Work Experience

Start: Aug 2019 — **Research Assistant at Wrocław University of Science and Technology**
- Developing an algorithm that predicts whether a particular bank transaction will be overdue
- Research on a mesh reconstruction of objects in the foreground from a single image

Nov 2016 - Feb 2019 — **Researcher and Developer at Identt, Wrocław**
- OCR system for personal documents under arbitrary lighting conditions
- OCR annotation tool for personal documents
- Personal document image generator using BRDF model
- Face identification using a single person's image
- Leading seminaries about Deep Learning algorithms and listener during seminaries about various algorithms related to Machine Learning field (that includes Monte Carlo simulation, VboW approach for image search engine)

Feb 2018 - May 2018 — **Researcher and Developer at CancerCenter, Wrocław**
- Application for histopathology images management
- Prostate segmentation on 3D MRI imagery

Jun 2017 - Sep 2017 — **Research Internship at Wrocław University of Science and Technology**
- Analysis of proteins' data as cloud of points where each point was an atom of a molecule
- Creating a deep algorithm for 3D pocket segmentation in a patch-wise manner

Jul 2016 - Oct 2017 — **Summer Trainee at Nokia, Wrocław**
- PlantUML diagrams for SCT/PIT Tests generator
- Web application for computer components monitor in Django
- Automatic boost to c++11 syntax converter
- Real time plotting utility of daily cluster nodes usage

Articles

American Sign Language Fingerspelling Recognition Using Wide Residual Networks
In: Rutkowski L., Scherer R., Korytkowski M., Pedrycz W., Tadeusiewicz R., Zurada J. (eds) Artificial Intelligence and Soft Computing. ICAISC 2018. Lecture Notes in Computer Science, vol 10841. Springer, Cham

Research Projects

Automatic traffic sign detection and recognition
A real-time system using deep learning detector and classifier using Tensorflow framework. The solution performs with high accuracy at 15 FPS on GTX 740m. Repository: ***github.com/vanitas-vanitatum/traffic-sign-recognition***

Audio Deep Dream
An implementation of a deep dream algorithm proposed initially by Google. The solution implements the same method that works on spectrograms. I applied a few modifications to make the results more diverse. A dreaming model was trained on gender classification dataset. Repository: ***github.com/kacper1095/speaker-gender-classification-and-deepdream***

METAVIR scale value prediciton
A project including a deep learning model for a prediction of one of METAVIR scale values from USG liver images. The best model is a pretrained DenseNet working on an image preprocessed with the NL means algorithm. The project required extracting ROIs where all the ground truth data (such as ROI coordinates and USG machine's parameters) was encoded in pixels of images. Repository: ***github.com/kacper1095/liver-usg-kaggle***

Hashtag recommendation system
An application recommending appropriate hashtag for a particular content of tweet using content embeddings and hashtag popularity measured by PageRank algorithm. Repository: ***github.com/data-boars/hashtag-recommendation-project***

Awards

2018, 2019	**Rector Awards for distinguished MSc student**
Apr 2019	**Pos Tagging – private Kaggle competition (1st place)** Best solution: temporal convolution with parallel branches combined by custom weighting model on POS tagging problem. Private competition. Repository: ***github.com/kacper1095/pos-tagging***
May 2018	**3rd place at BankItUp Hackathon in Wrocław** We proposed a solution for a potential credit recipient recommendation. It was a web application which ranked companies according to their capital, starting date of the economic activity and other information available at government websites.
2018	**Dean Award for distinguished BSc student**
2015, 2016, 2017, 2018	**Rector Awards for distinguished BSc student**

Teaching & Additional Activities

Nov 2016 – Jul 2019	**Active member of medical.ml scientific students group** • Projects: EMG data analysis in search of common characteristics for pseudomiotonic signal and METAVIR scale prediction from USG liver images • Internal courses: statistics and a theory behind Machine Learning algorithms, their various applications • Seminaries: mainly about novelties in the area of machine learning and Deep Learning
Nov 2017 – Oct 2019	**Open lectures and workshops** • Lectures on introduction to Machine Learning, Artifical Neural Networks and Deep Learning • Workshops on how libraries such as Tensorflow, Keras and PyTorch are constructed and how to use them on toy examples

Additional information

Research interests:	Inverse computer graphics, representation learning, generative modelling
Fields of expertise:	Deep learning, computer vision, data analysis, explainable machine learning, linear algebra, speech processing, linear algebra
Programming:	Python (advanced), C++ (intermediate), Java (intermediate)
Frameworks:	PyTorch, Tensorflow, OpenCV, Keras, Pandas, CUDA, Docker
Languages:	English (C1), Russian (Basic), Polish (native)