

ZHANG, ZIHAN

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EDUCATION

Master of Science with Distinction @ University of Edinburgh (UK) Sep. 2017 - Nov. 2018
Data Science @ School of Informatics **GPA: 76%, 4.0/4.0**

- Core Courses: Machine Learning and Pattern Recognition (69%), Machine Learning Practical (84%), Probabilistic Modelling and Reasoning (90%), Data Mining and Exploration (80%), Extreme Computing (72%), etc.
- The grades of all courses and the dissertation are at level A ($\geq 70\%$), except one (69%).

Bachelor of Science @ Shandong University (985 & 211 project, China) Sep. 2013 - Jun. 2017
Mathematics and Applied Mathematics @ School of Mathematics **GPA: 85%**

- Related Courses: Probability Theory (89%), Mathematical Statistics (95%), Applied Statistics (88%), C language (95%), C++ (92%), Java (92%), Data Structure (85%), Database (95%), Linux Operating System (84%), etc.
- Graduated from *Hua Luogeng Class*, a National Mathematical Training Base, the top 3 in China by specialization.

WORK EXPERIENCE

Algorithm Engineer @ Central Research Institute, Huawei Dec. 2018 - Now
Enterprise Intelligence Group @ Noah's Ark Lab (AI Lab)

Responsibility: Optimize Huawei's supply chains in terms of factory planning and logistics using machine learning, mixed-integer programming and heuristic methods.

RESEARCH & PROJECTS

Logistics Optimization @ Huawei Jun. 2019 - Now
Group project, with three other colleagues.

Main development tools: Python, Java, Scala and Spark.

1. Develop general 2D and 3D bin packing algorithms, using tree search and heuristic algorithms, and customize them for different scenarios, taking into account the real constraints.
2. Design vehicle routing and cargoes splitting strategies for the different scenarios by mathematical programming or heuristic methods.
3. Accelerate the programs by distributing them to multiple servers.
4. The whole project helps Huawei reduce at least 16 million USD of logistics costs per year.

Factory Planning @ Huawei Dec. 2018 - May. 2019
Group project, with five other colleagues.

Main development tools: Python and Gurobi.

1. Participate in developing the production planning engine for multiple factories.
2. Model the real production data and constraints by mixed-integer programming and heuristic methods.
3. Develop automatic test module for the production planning engine.

TensorFlow Applied to Neural Language Models @ Amazon & UoE Jun. 2018 - Aug. 2018
MSc thesis (72%), supervised by Dr. Ben Allison and Dr. Tania Bakhos. [pdf](#) and [code](#)

Main development tools: Python, especially TensorFlow and PyTorch.

1. Implement Neural Language Models with Mixture of Softmaxes using TensorFlow to solve the Softmax bottleneck.
2. Optimize hyperparameters mainly by specific Random Search; explore the influence of different LSTM implementations provided by TensorFlow and the number of Softmax components. Speed up training by: training models in parallel on multiple GPUs; weight tying; weight matrix factorization; Gradient Clipping.
3. Evaluate the models in terms of accuracy, the number of parameters, training speed, etc. The final model has lower validation and test perplexities as well as higher speed, compared with the original model.
4. Compare the final TensorFlow model with the same model implemented using PyTorch.

Instance Segmentation of Nucleus Images @ University of Edinburgh Feb. 2018 - Apr. 2018
Coursework (90%), with two other teammates, supervised by Prof. Steve Renals. [pdf](#)

Main development tools: Python, especially TensorFlow and Keras.

1. The objective is to segment nucleus instances from nucleus images acquired in different microscopy systems.
2. In the baseline experiments, use fully convolutional networks with VGG16 backbone to semantically segment nuclei from the background, and use open operation to separate individual nuclei.
3. In the contrast experiments, apply Mask RCNN to directly segment nucleus instances. Extract features by ResNet101 with Feature Pyramid Networks; select regions of interest by Region Proposal Networks; semantically segment the nuclei in all regions by fully convolutional networks.
4. Implement the two models and pre-train them on COCO datasets and evaluate them by mean average precision. Mask RCNN significantly outperforms the baseline model.

Marketing: Predicting Customer Behaviors @ University of Edinburgh Mar. 2018 - Apr. 2018
Coursework (75%), with three other teammates. [pdf](#)

Main development tools: Python, especially Pandas, scikit-learn and Keras.

1. Preprocess the large and dirty market dataset provided by KDD Cup 2009 competition through clipping variables, filling in missing data, encoding categorical data by one hot, reducing dimensions, etc.
2. Predict the three behaviors by deep models; optimize hyperparameters; evaluate the results by AUC scores.
3. In terms of customer churn behavior, the prediction AUC exceeds the first place of the competition.

AWARDS & HONORS

Informatics International Master's Scholarship @ University of Edinburgh	Nov. 2017
Hua Luogeng Scholarship @ Hua Luogeng Class, Shandong University	Dec. 2016
Honorable Mention @ Interdisciplinary Contest in Modeling (US)	Apr. 2016
First Prize @ Shandong Province Mathematics Competitions (China)	Dec. 2015
Third Prize @ Chinese Mathematics Competitions	Nov. 2015
Second Prize @ China Undergraduate Mathematical Contest in Modelling (Shandong Province)	Oct. 2015
Meritorious Winner @ Certificate Authority Cup International Mathematical Contest in Modelling	Jan. 2015
Merit (96/100) @ National Computer Rank Examination (Level 2) with specialization in C language	Apr. 2014

SKILLS

Advanced	Python, Java, Linux
Good	Scala, Spark, Hadoop, SQL, C/C++, Docker