Yue, Zhenrui

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EDUCATION

Technische Universität München   **Munich, Germany**

M.Sc. in Robotics, Cognition, Intelligence   *Apr 2019 – Present*

- GPA: **1.2 / 1.0 (Best 3%, German grading scale)**
- Thesis Topic: Representation Learning for Question Answering under Domain Shift at **ETH Zurich**
- Courses: Intro to AI, Machine Learning, Deep Learning, Multiple View Geometry, Cognitive System, Software Systems Practicum, Data Analytics and Intelligent Systems, Robotics, Motion Planning, Intro to Economics etc.

University of California San Diego   **San Diego, CA, U.S.**

Master's Exchange in Computer Science   *Sep 2019 – Jun 2020*

- GPA: **3.96 / 4.0 (U.S. grading scale)**
- Research Project: Model Extraction and Adversarial Attacks on Recommender Systems
- Courses: Intro to DS, Modeling & Data Analysis, Probabilistic Reasoning & Decision-Making, Web Mining & Recommender Systems, Pattern Recognition, Optimization for Data Science, Probs & Stats etc.

Technische Universität München   **Munich, Germany**

B.Sc. in Mechanical Engineering   *Oct 2015 – Mar 2019*

- GPA: **2.3 / 1.0 (Best 20%, German grading scale)**
- Areas of Specialty: **Mechatronics and Information Technology**
- Thesis Topic: Development of a Concept for Visualizing Variation Points in Industrial PLC Software
- Courses: Mathematics, Physics, Mechanics, Dynamics, Electrical Engineering, Engineering Automation, Control Theory, Simulation Technology, Intro to CS, Software Engineering, Data Structures & Algorithms etc.

PUBLICATION

Maximum Mean Discrepancy-Based Representation Learning for Question Answering under Domain Shift

- **Zhenrui Yue**, Bernhard Kratzwald, Stefan Feuerriegel
- *In progress*

Black-Box Adversarial Attacks on Sequential Recommender Systems via Data-Free Model Extraction

- **Zhenrui Yue***, Zhankui He*, Huimin Zeng, Julian McAuley
- *The Web Conference 2021 (WWW 2021), in submission*

BERT4NILM: A Bidirectional Transformer Model for Non-Intrusive Load Monitoring

- **Zhenrui Yue**, Camilo Requena Witzig, Daniel Jorde, Hans-Arno Jacobsen
- *Proceedings of the 5th International Workshop on Non-Intrusive Load Monitoring (NILM 2020)*

Development of a Concept for Visualizing Variation Points in industrial PLC Software

- **Zhenrui Yue**
- *Bachelor's Thesis, TUM University Library*

RESEARCH

Representation Learning for Question Answering under Domain Shift   **Zurich, Switzerland**

Eidgenössische Technische Hochschule Zürich, Prof. Stefan Feuerriegel   *Sep. 2020 – Present*

- Investigate domain adaptation techniques of Q&A systems under unsupervised and semi-supervised setting
- Train BERT-QA model on source data and calibrate with either input or both input and output data from target dataset
- Design domain critics with KL Divergence, Wasserstein Metric and Maximum Mean Discrepancy to reduce feature discrepancy
- Propose a hierarchical critic net to enhance network's capacity on feature discrepancy reduction and representation adaptation
- Experiment with SQuAD as source data, evaluate on various target datasets and outperform SOTA metrics on domain adaptation

Model Extraction and Adversarial Attacks on Recommender Systems   **San Diego, CA, U.S.**

University of California San Diego, Prof. Julian McAuley   *Mar. 2020 – Oct. 2020*

- Designed a framework for autoregressive data generation, model extraction and adversarial attacks on recommender systems
- Generated synthetic data based on black-box model (NARM, SASRec and BERT4Rec) APIs with the autoregressive property
- Distilled a white-box model with generated data via knowledge distillation and utilized the model to produce adversarial examples
- Designed algorithms for generating adversarial perturbations and data poisoning attacks in the item space under certain budgets
- Evaluated proposed method on multiple datasets and successfully biased black-box models for both untargeted and targeted attacks

Bidirectional Transformer for Non-Intrusive Load Monitoring
Technische Universität München, Prof. Hans-Arno Jacobsen

Munich, Germany
Apr. 2020 – Aug. 2020

- Conducted a thorough analysis on SOTA NILM models and a benchmark experiment on public datasets
- Designed a loss function based on KL divergence, soft margin and L1 norm that significantly improved model performance
- Adapted bidirectional encoder representations from transformers for NILM with convolutional embedding layer and MLP net
- Evaluated BERT4NILM with proposed loss function on REDD & UK-DALE datasets and outperformed SOTA models by 3 - 25%

Graphical Trajectory Prediction with Graph Attention GAN
University of California San Diego, Course Project

San Diego, CA, U.S.
Jan. 2020 – Mar. 2020

- Analyzed and reproduced SOTA neural network architectures in the field of trajectory prediction
- Proposed LSTM-based models and Graph Attention GAN (GAT-GAN) based on Graph Attention and Social-GAN
- Evaluated GAT-GAN on KITTI, UCY and ETH and achieved better FDE / ADE results than SOTA models on some metrics

Autonomous Navigation and Parking based on 2D-LiDAR SLAM
Technische Universität München, Course Project

Munich, Germany
May. 2019 – Sep. 2019

- Implemented ROS Navigation System and SLAM on a RC-Car with Raspberry Pi, LiDAR and multiple sensors
- Designed a parking-route planning algorithm with Bezier curves and integrated SLAM functions for route selection
- Implemented self-correcting mechanisms based on PID controller and Kalman filter for accurate positioning and following
- Deployed the system on the RC-Car and achieved smooth & accurate parking in 3 different parking scenarios, see **video**

Statistical Evaluation on Public Policy and Suicide Prevention
Sun Yat-sen University, Prof. Xing Ni

Guangzhou, China
Jun. 2018 – Sep. 2018

- Investigated suicide rates in multiple countries based on OECD suicide data and health policy studies
- Quantified influence factors like public health policies, protective measures, financial conditions and social status
- Identified possible climatic and geological factors based on geospatial analysis and detected relevant groups of risk
- Built machine learning models to evaluate predictive analysis on possible policy changes and their impacts on suicide rates

EXPERIENCE

Siemens AG
Software Development Intern (Part Time)

Munich, Germany
Dec 2018 – Sep 2019

- Supported the team to formulate procurement strategy, conducted technical researches and created presentations
- Developed cloud purchasing database (MS-SQL), add-ins (JavaScript) & access application and deployed for the team
- Implemented a web crawler based on Scrapy and regular expressions to extract product specs data from over 20 companies
- Helped build a purchasing process software from filtering potential products, automatic documentation to order entry generation

Volkswagen Group China
Project Management Intern

Beijing, China
Nov 2017 – May 2018

- Coordinated Volkswagen engine and transmission projects (EA211, DQ series) with relevant R&D departments
- Designed a JavaScript program for milestone scheduling, report generation and deployed it for a twelve-people team
- Reviewed EA211 engine modification requests and conducted evaluations including both hardware & software changes

Technische Universität München
Teaching Assistant

Munich, Germany
Jun 2017 – Sep 2017

- Provided consultation on coursework and academic progress for PhD students in Dept. of Mechanical Engineering
- Organized PhD-level courses / seminars and conducted researches, presented concepts for possible improvements
- Maintained graduate school homepage, student information database and supported the team in administrative affairs

AWARDS

2020 **E-fellows.net Scholarship**, *ZEIT Verlagsgruppe and McKinsey & Company Inc*
2019 **Max Weber International Exchange Scholarship**, *German National Academic Foundation*
2018 **Audi Campus Ambassador Scholarship**, *Audi (China) Enterprise Management Co., Ltd.*
2017 **Audi Campus Ambassador Scholarship**, *Audi (China) Enterprise Management Co., Ltd.*
2017 **Max Weber Program**, *German National Academic Foundation*
2016 **Shiyu Scholarship**, *Guangdong Unis Technology Co., Ltd*

SKILLS

Languages: Native in Mandarin and Cantonese, proficient in English and German, beginner in Spanish
Coding: Python, JavaScript, C/C++; experiences with Pandas, PyTorch, TensorFlow
Platform: Git, Bash, AWS, Google Cloud
Others: CAD, MATLAB & Simulink