ZHENGUO CHEN

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EDUCATION

University of Colorado Boulder, Colorado, USA *Aug 2016 - May 2018*
College of Engineering and Applied Science
Master's Degree: Computer Science GPA: 4.0

Nankai University, Tianjin, China *Aug 2012 - May 2016*
B.S. in Information Security
B.A. in Law Overall GPA: 3.5

TECHNICAL STRENGTHS

Interests Machine Learning, Computer Vision, Natural Language Processing
Skills Python, C++, TensorFlow, Pytorch, Django, Docker, AWS

PROFESSIONAL EXPERIENCE

Clinc, Inc. June 2018 - Present
Software Engineer (Core AI R&D Team) *Ann Arbor*

- Researched and enhanced Clinc Natural Language Understanding (NLU) with new capabilities, including entity-linking, recursive query handling and out-of-domain detection.
- Developed improvements for NLU models in terms of accuracy and training time, with various deep neural network models, such as **attention-BiLSTM**, **Transformer**, etc.
- Built and integrated models with business logic servers for multiple clients, including top 10 banks in US and Europe with up to **6 million** users.
- Lead multiple **production projects** which were deployed on different channels. Devised, developed and delivered end-to-end solutions for challenging customer problems.

RESEARCH EXPERIENCE

Out-of-Domain Query Detection Jan 2020 - Present
Clinc Research Project

- Researched, optimized OOD detection models as potential solutions to improve Clinc NLU capability (improved ROC scores by around **6%**).
- Implemented Prototypical Network to support OOD detection for datasets both with and without OOD training data.
- Explored and evaluated multiple models (Proto, **Bert**, **Fasttext**, etc.) across multiple datasets.

Enhance Dialog System with Slot Relation Extraction (RE) Nov 2019 - Present
Clinc Research Project

- Designed and conducted experiments to demonstrate the benefits of augmenting a dialog system with RE model (extract relations between entities). Paper under review for **EMNLP 2020**.
- Built state-of-the-art RE models (attention & transformer) and designed an end-to-end solution.
- Integrated RE with Clinc dialog system to support customer projects.
- Designed relation annotation GUI tool for crowdsourcing.

Slot Tree for Handling Recursive Queries Sept 2018 - Jan 2019
Clinc Production Project

- Devised and developed algorithms to generate tree structures (Slot Tree) for named-entities.
- Applied slot tree to handle recursive queries, which was used in production.
- Designed user-friendly response generation for recursive queries.

Image Captioning Using Neural Network Jan - May 2017
Master's Project, CU Boulder *Advisor: Chris Ketelsen*

· Built Convolution Neural Network (VGG16/19) and NLU model (LSTM) to extract features and generate descriptive captions for images.
· Designed and developed web pages as an end-to-end solution for user.
· YouTube video available here

Autonomous Vehicle with Obstacle Detection Jan - May 2017
Master's Project, CU Boulder *Advisor: Chris Heckman*

· Built SLAM (Simultaneous localization and mapping) on robot for localization.
· Built real-time object detection module with OpenCV.
· Integrated modules in ROS (Robot OS) to facilitate communication between components.

NXP Asymmetric Encryption Implementation and Optimization Jan - Jun 2016
Undergrad Dissertation, Nankai University *Advisor: Zheli Liu*

· Built RSA (cryptosystem) and optimized it with Montgomery algorithm.
· Programmed and utilized NXP Fame2 co-processor to accelerate RSA encryption.
· Built ECC (cryptosystem) and optimized it with Jacobian coordinate.
· Programmed and utilized NXP Fame2 co-processor to accelerate ECC encryption.

Dual Deception Secret Sharing Improvement Jan - Jun 2016
Undergrad Project, Nankai University *Advisor: Zhaohui Li*

· Implemented Random Grid-based Visual Secret Sharing algorithm for secret sharing.
· Improved RGVSS with dual deception (hiding secret information in multiple images).
· Built dual deception RGVSS and evaluated its security.

Book Recommendation System Based on Douban Reviews Mar 2014 - Apr 2015
Undergrad Project, Nankai University *Advisor: Jie Liu*

· Collected and parsed user data from Douban (a book review website).
· Applied Lucene as recommendation engine to model users' interest.
· Designed and developed backend for final website.

TEACHING

· Teaching Assistant CSCI3155 Principle of Programming Language, CU Boulder
· Graduate Course Assistant CSCI5622 Machine Leanring, CU Boulder