

# ZHENGUO CHEN

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## EDUCATION

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**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

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**Interests** Machine Learning, Computer Vision, Natural Language Processing

**Skills** Python, C++, TensorFlow, Pytorch, Django, Docker

## PROFESSIONAL EXPERIENCE

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**Clinic, Inc.**

June 2018 - Present

*Software Engineer (Core AI R&D Team)*

*Ann Arbor*

- Researched and enhanced Clinic 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.
- Devised, developed and delivered solutions for challenging customer problems.

## RESEARCH EXPERIENCE

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**Enhance Dialog System with Slot Relation Extraction (RE)**

Nov 2019 - Present

*Clinic 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 Clinic dialog system to support customer projects.

**Out-of-Domain Query Detection**

Jan 2020 - Present

*Clinic Research Project*

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

**Slot Tree for Handling Recursive Queries**

Sept 2018 - Jan 2019

*Clinic 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**

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- Teaching Assistant CSCI3155 Principle of Programming Language, CU Boulder
- Graduate Course Assistant CSCI5622 Machine Learning, CU Boulder