
EDUCATION

- **Shanghai Jiao Tong University (SJTU)** Shanghai, China
B.E. in Information Security, School of Cyber Security *Sept. 2015 – June. 2019 (Expected)*
 - **GPA:** 3.96/4.3 (91.6/100) **Rank:** 2/97
 - **TOEFL:** R27, L27, S20, W28, Total 102 **GRE:** V145, Q170, AW4.0

PUBLICATIONS

- **LiDAR-Video Driving Dataset: Learning Driving Policies Effectively.**
Jingkang Wang*, Chenyi Ping*, Jonathan Li, Cewu Lu, Zhipeng Luo, Han Xue and Cheng Wang.
In Proceedings of IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018

SUBMISSIONS & PRE-PRINTS

- **Reinforcement Learning with Perturbed Rewards**
Jingkang Wang, Yang Liu and Bo Li.
In Submission to 7th International Conference on Learning Representations (ICLR), 2019 (*arXiv:1810.01032*)
- **One Bit Matters: Understanding Adversarial Examples as the Abuse of Redundancy.**
Jingkang Wang, Ruoxi Jia, Gerald Friedland, Bo Li and Costas Spanos.
In Submission to 7th International Conference on Learning Representations (ICLR), 2019
- **The Helmholtz Method: Using Perceptual Compression to Reduce Machine Learning Complexity.**
Gerald Friedland, **Jingkang Wang**, Ruoxi Jia, Bo Li and Nathan Mundhenk.
In Submission (*arXiv:1807.10569*)
- **Multiple Character Embeddings for Chinese Word Segmentation.**
Jingkang Wang, Jianing Zhou and Gongshen Liu.
In Submission (*arXiv:1808.04963*)

RESEARCH PROJECTS

- **Reinforcement Learning with Perturbed Rewards** *July 2018 - Sept. 2018*
 - Introduce an unbiased estimator of reward in reinforcement learning which guarantees risk minimization without any assumptions on the true distribution.
 - Propose an efficient iterative algorithm for estimating the confusion matrices of corrupted rewards in the training.
 - Study the convergence and finite sample complexity theoretically under the proposed reward proxy.
- **Blockchain-Based Genetic Privacy-Preserving System** *May 2018 - July. 2018*
 - Design a protocol of private set intersection (PSI) on the blockchain, namely BPSI, which establishes a crowdsourcing ecology and calculates PSI against collusion.
 - Propose security, effectiveness and arbitration mechanism in BPSI, which guarantee the efficiency of the proposed protocol theoretically.
- **Understanding Adversarial Examples as the Abuse of Redundancy** *March 2018 - May. 2018*
 - Propose a model for adversarial examples consistent with related work, physics and information theory.
 - Prove that input redundancy is indeed a necessary condition for being able to generate adversarial examples.
 - Validate that adversarial examples are indeed overflowing perceptrons trained on a certain level of redundancy.
- **Multiple Embeddings for Chinese Word Segmentation** *Feb. 2017 - May. 2018*
 - Leverage both semantic and phonetic meanings of Chinese characters in NLP tasks by introducing *Pinyin Romanization* and *Wubi Input* Embeddings.
 - Achieve the state-of-the-art performance in AS and CityU corpora with F1 scores 96.9 and 97.3.
- **Reinterpreting Helmholtz Free Energy in Machine Learning** *March 2018 - June. 2018*
 - Propose to reinterpret the Helmholtz free energy formula to explain the relationship between content and noise for sensor-based data.
 - Demonstrate this relationship can be observed as predicted in machine learning experiments on diverse datasets.
 - Verify our noise quantification method can be used to speed up the training of deep learning classifiers significantly while maintaining, or sometimes even improving, overall classification accuracy.
- **Dynamic Searchable Encryption System Based on Graph Database** *May 2017 - July. 2017*
 - Improve the parallel dynamic searchable algorithm and propose several auxiliary policies to enhance the security.

- Implement, visualize and validate the efficient and scalable algorithm based on Neo4j graph database.
- **Benchmark for Driving Policy Learning** 🌟 🌟 *Apr. 2017 - Feb. 2018*
 - Propose a dataset which is the first policy learning benchmark composed of driving videos, LiDAR data, and corresponding driving behaviors.
 - Conduct the complete analysis on how important depth information is, how to leverage depth information and what we can achieve by utilizing current techniques.

RESEARCH EXPERIENCES

- **Machine Vision and Intelligence Group (MVG)** Shanghai, China
Undergraduate Researcher (1 paper published) *Apr. 2017 - Present*
 - **Advisor:** Professor Cewu Lu
 - **Research Focus:** Computer Vision, Deep Learning, Autonomous Driving
- **University of California, Berkeley** Shanghai, China
Research Intern (Remotely, 3 papers involved) *March 2018 - Oct. 2018*
 - **Advisor:** Professors Bo Li and Dawn Song
 - **Research Focus:** Secure AI, Adversarial Machine Learning, Reinforcement Learning
- **Shanghai Key Laboratory of Integrated Technology** Shanghai, China
Research Assistant (National Security Competition Targeted, 1st in Shanghai) *May 2017/18 - July 2017/18*
 - **Advisor:** Professor Lei Fan
 - **Research Focus:** Blockchain, Privacy Preserving, Searchable Encryption
- **National Engineering Lab for Information Context Analysis Technology** Shanghai, China
Research Assistant (Undergraduate Research Program in SJTU, Level-A: Top 5%) *Jan. 2017 - Sept. 2017*
 - **Advisor:** Professor Gongshen Liu
 - **Research Focus:** Data mining, Password Generation, Natural Language Processing

HONORS & AWARDS

- **National Scholarships (Top 0.2% Nationwide)** *2016, 2017, 2018*
- **Level-A SJTU Outstanding Scholarships (Top 1%)** *2016, 2017, 2018*
- **Yitu Technology Scholarship (Top 1%)** *2017*
- **First Prize in National College Students Information Security Competition (1st in Shanghai)** *2018*
- **Meritorious Winner Prize of Mathematical Contest in Modeling** *2018*
- **Second Prize in National College Students Information Security Competition** *2017*
- **Second Prize in The Chinese Mathematics Competitions (Shanghai)** *2017*
- **SJTU Merit Students** *2016, 2017, 2018*
- **SJTU Excellent League Cadres** *2016, 2017*
- **First Prize in National Mathematics Olympic Games (10th in Province)** *2014*

OPEN-SOURCE CONTRIB.

- 🌟 **OpenAI-baselines** A set of high-quality implementations of RL algorithms (*Stars: 5.6k*)
- 🌟 **DBNet** A large-scale driving behavior dataset (videos + point clouds) (*Stars: 78*)
- 🌟 **awesome-scs** Programming reference for Information Security Major (*Stars: 22*)