YUAN GONG

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EDUCATION

University of Notre Dame — Notre Dame, IN
Ph.D. Computer Science & Engineering (GPA: 4.0) — August 2020

Fudan University — Shanghai, China
B.S. Electronic Engineering (*Biomedical Engineering Major*) (GPA Rank: 1/15) — July 2015

PROFESSIONAL EXPERIENCE

Amazon Web Service (AWS) — Seattle, WA
Applied Scientist Intern, Comprehend Team — May 2019 – August 2019

- Investigating state-of-the-art deep learning based natural language processing techniques for extracting relationships and entities (including medical conditions, medications, treatment, test and procedures) from clinical text in multiple languages, significantly improved the model performance.

University of Notre Dame — Notre Dame, IN
Graduate Research Assistant, CSE Department — August 2015 – Present

Speech & Security Project

- Investigate new threats (e.g., adversarial attack, replay attack) to machine learning based speech processing models and corresponding defense strategies to mitigate risk from attack.
- Designed and collected the first open access large scale dataset "ReMASC" for protecting voice controlled systems from replay attack in realistic settings. The dataset is used by research labs including Chinese Academy of Sciences, Samsung Research, VISA Research, and UBER Research.
- Published a series of papers on speech models and corresponding attacking/defense strategies at conferences including IJCAI, Interspeech, ICCCN, IotSec, ACSAC, and DYNAMICS as lead author.

Speech & Healthcare Project

- Designed novel speech-based automatic diagnostic systems for autism, depression, and emotional disorders based on machine learning speech and language processing techniques.
- Achieved first place for depression detection system design at AVEC 2017 (the most renowned worldwide annual challenge in the field). Best performance out of 25+ submissions.
- Published papers at top healthcare informatics conferences including ACM-BCB & ICHI as lead author.

Fudan University — Shanghai, China
Undergraduate Research Assistant, EE Department — June 2014 – July 2015

- Chaired the team of three to build "smart ECG monitor" system, won the first prize of 2014 Texas Instrument national biomedical electronics innovation design contest, and published the corresponding design in *Chinese Journal of Medical Instrumentation* as lead author.

Philips — Shanghai, China
Intern, Healthcare Department — July 2014 – August 2014

- Coordinated maintenance information collection and conducted on-site maintenance for CT/MR equipment places in 50+ hospitals throughout Shanghai.

SERVICE

Reviewer, IEEE TASL; IEEE TDSC; IEEE SPL — September 2018– Present
ACM-BCB 2019 Travel Grant Committee Member — August 2019
Undergraduate Research Advisor, University of Notre Dame — July 2015 – Present
Dissertation Committee Member of Marisa Cameron (Master Student) — April 2017

TECHNICAL SKILLS

Math: Real & Functional Analysis, Optimization, Neural Networks, Statistical Computing Methods.
Computer Science: Data Science, Machine Learning, Deep Learning, Speech Processing, Natural Language Processing, Algorithms, Computer Architecture, Operating Systems.
Programming Languages: Python, MATLAB, Java, C.
Deep Learning Tools: Tensorflow, Pytorch, MXNet.
Languages: English, Chinese (Fluent), Germany (Basic, TestDaF Reading/Writing/Speaking: 3/5).

SELECTED AWARDS

ISCA INTERSPEECH 2019 Best Student Paper Award Nomination — July 2019
Travel Award from IJCAI, NSF, ISCA, ICHI ($2500+) — August 2017 – August 2019
Depression Challenge Winner, AVEC 2017 — October 2017
Fudan First Prize Scholarship (Top 3%) and Outstanding Graduates (Top 10%) — April/July 2015
First Prize, Texas Instrument National Biomedical Electronics Innovation Design Contest — October 2014

SELECTED PUBLICATIONS

13. Yuan Gong, Jian Yang, and Christian Poellabauer, "**Detecting Replay Attacks Using Multi-Channel Audio: A Neural Network-Based Method**", IEEE Signal Processing Letters, 2020 (to appear).
12. Ning Xia, Yuan Gong, Yizhe Zhang, and Christian Poellabauer, "**Non-local Second-order Attention Networks for Person Re-identification**", Proc. of the 2019 ICCV, Seoul, Korea, October 2019.
11. Yuan Gong, Jian Yang, Jacob Huber, Mitchell MacKnight and Christian Poellabauer, "**ReMASC: Realistic Replay Attack Corpus for Voice Controlled Systems**", Proc. of INTERSPEECH 2019, Graz, Austria, September 2019 (***ISCA best student paper award nomination***).
10. Yuan Gong, Boyang Li, Christian Poellabauer and Yiyu Shi, "**Real-Time Adversarial Attacks**", Proc. of the 28th International Joint Conference on Artificial Intelligence (IJCAI), Macao, August 2019.
9. Yuan Gong and Christian Poellabauer, "**Deep Obfuscation: Precise Masking of Sensitive Information to Protect Against Machine Learning Adversaries (Poster)**", Proc. of the 2018 Annual Computer Security Applications Conference, San Juan (ACSAC), Puerto Rico, December 2018.
8. Yuan Gong and Christian Poellabauer, "**Crafting Adversarial Examples For Speech Paralinguistics Applications**", Proc. of the DYnamic and Novel Advances in Machine Learning and Intelligent Cyber Security (DYNAMICS) Workshop, San Juan, Puerto Rico, December 2018.
7. Yuan Gong and Christian Poellabauer, "**Impact of Aliasing on Deep CNN-Based End-to-End Acoustic Models**", Proc. of INTERSPEECH 2018, Hyderabad, India, September 2018.
6. Yuan Gong, Hasini Yatawatte, Christian Poellabauer, Sandra Schneider, and Susan Latham, "**Automatic Autism Spectrum Disorder Detection Using Everyday Vocalizations Captured by Smart Devices**", Proc. of the 9th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB), Washington, DC, August-September 2018.
5. Yuan Gong, Kevin Shin, and Christian Poellabauer, "**Improving LIWC Using Soft Word Matching (Poster)**", Proc. of the 9th ACM Conference on Bioinformatics, Computational Biology, and Health Informatics (ACM-BCB), Washington, DC, August-September 2018.
4. Yuan Gong and Christian Poellabauer, "**Protecting Voice Controlled Systems Using Sound Source Identification Based on Acoustic Cues**", Proc. of the 27th International Conference on Computer Communications and Networks (ICCCN), Hangzhou, China, July-August 2018.
3. Yuan Gong and Christian Poellabauer, "**An Overview of Vulnerabilities of Voice Controlled Systems**", 1st International Workshop on Security and Privacy for the Internet-of-Things, Orlando, FL, April 2018.
2. Yuan Gong and Christian Poellabauer, "**Topic Modeling Based Multi-modal Depression Detection**", Proc. of the 7th Audio/Visual Emotion Challenge and Workshop (AVEC) in conjunction with ACM Multimedia (ACM-MM), Mountain View, CA, October 2017. (***challenge winner***)
1. Yuan Gong and Christian Poellabauer, "**Continuous Assessment of Children's Emotional States using Acoustic Analysis**", Proc. of the 5th IEEE International Conference on Healthcare Informatics (ICHI), Park City, UT, August 2017.