Mengdi Li

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Date of birth: 18th May 1994. HENAN CHINA

Education

2016.9-Present **College of Information and Electrical Engineering, China Agricultural University**
Master of Engineering (MEng), *Computer Science*

- ✧ Research area: **Machine Learning applications to Multimedia Security, Deep Learning and Multimedia Processing**
- ✧ Advisor: Yiming Xue Second Advisor: Ping Zhong
- ✧ GPA: 3.11/4.0 (81/100)

2012.9-2016.6 **College of Information and Electrical Engineering, China Agricultural University**
Bachelor of Engineering (BEng), *Electronic and Information Engineering*

- ✧ GPA: 3.13/4.0 (82/100)

Honors and Awards

- ✧ **The Best 100 Graduation Project** of China Agricultural University in 2016 (June, 2016)
- ✧ **The Third Prize** in Beijing Contest District in National Undergraduate Electronics Design Contest (October, 2015)

Journal Papers

- ✧ **Mengdi Li**, Kai Mu, Ping Zhong, Juan Wen, Yiming Xue. "Generating Steganographic Image Description by Dynamic Synonym Substitution" *Signal Processing* (Under Review, SCI journal)
- ✧ Ping Zhong, **Mengdi Li**, Kai Mu, Juan Wen, Yiming Xue. "Image Steganalysis in High-Dimensional Feature Spaces with Proximal Support Vector Machine" *International Journal of Digital Crime and Forensics* (Published, EI journal, http://doi.org/10.4018/IJDCF.2019010106, Full Text PDF)
- ✧ Juan Wen, Xuejing Zhou, **Mengdi Li**, Ping Zhong. "A Novel Natural Language Steganographic Framework Based on Image Description Neural Network" *Journal of Visual Communication and Image Representation* (Revision Submitted to Journal, SCI journal)

Research/Project

1. Research: a method of generating steganographic image description automatically by deep neural networks
   Supported by **National Natural Science Foundation of China (Grant No.61802410 and 61872368)**
   October 2017 - July 2018 (10 months)
   - ✧ Studied the feasibility of hiding information during the process of generating image description.
   - ✧ Designed and built a steganographic image description model using Tensorflow.
   - ✧ Designed a novel embedding algorithm, which **gained a 20% increase in security** against the state-of-the-art detection algorithm, by preserving the statistical characteristics of word frequency.
   - ✧ Evaluated our method in security and capacity
   - ✧ **Finished a research paper.**

2. Research: a faster machine learning based steganalysis algorithm in high-dimensional feature spaces
   Supported by **National Natural Science Foundation of China (Grant No. U1536121)**
   June 2017 - September 2017 (4 months)
   - ✧ Compared the performance of some existing classification algorithms including PSVM, FLD, ridge regression and other variants in detection accuracy and efficiency for detecting images carrying secret data.
   - ✧ Participated in the design of our method PSVM-ELM.
   - ✧ Evaluated our method by comparing it with FLD, ridge regression and PSVM in detection accuracy and efficiency.
   - ✧ Experimental results show that the **detection accuracy of our method is increased by about 2%** for the spatial domain steganographic schemes and its **computational time is apparently less (6~10 times)** than that of the FLD and ridge regression for large feature sets.

3. Project: building an Android software to encode secret information in real-time video
   June 2016 - January 2017 (8 months)
   - ✧ Acted as **the primary developer responsible for** this project**.**
   - ✧ Designed the software framework: audio and video data are captured and transferred to a native FFmpeg(x264) library, in which audio and video data are compressed into a MP4 file.
   - ✧ Designed and implemented an efficient multithread hiding algorithm, which makes it possible to hide information in real-time recorded video.
   - ✧ To the best of our knowledge, this is **the first** tool to hide information in a real-time video. It is **much securer** than traditional means of hiding secret data in a stored video file.

Conferences

- ✧ Took part in **The 15th International Workshop on Digital Forensics and Watermarking** held by Institute of Information Engineering, Chinese Academy of Sciences (September, 2016)
- ✧ Took part in **The 10th China Information Hiding Workshop** held by South China University of Technology (March, 2018)

Skills

Knowledge of:

Python • C/C++ • Matlab • Unix/Linux • Vim • LaTeX • Machine Learning (CNN, LSTM, SVM, ELM) • TensorFlow • Android (Java, Native Development) • Video Codec(H.264, FFmpeg&x264)

Exposure to:

Git • SVN • Shell • Web Development(Javascript, HTML, CSS) • Verilog

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Languages

Chinese (Native)
English (IELTS: Listening-7, Reading-8, Speaking-5.5, Writing-5.5, OVERALL-6.5)