

Li Mengdi

Master Candidate for Computer Science
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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 (National 985 Project University)**

Master of Engineering (MEng), *Computer Science*

✧ Research area: **Machine Learning applications to Steganalysis, 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, [Full Text PDF](#))
- ✧ 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 app that can embed secret information into real-time video
June 2016 - January 2017 (8 months)
 - ✧ Acted as **the primary developer responsible for** this project.
 - ✧ Designed the software framework: video data is captured by camera and transferred to a native FFmpeg(x264) library, in which data is compressed into H.264 format.
 - ✧ Designed and implemented a real-time embedding algorithm for streaming video.
 - ✧ To the best of our knowledge, this is **the first** tool to embed information into a real-time video. It is **much securer** than traditional means of hiding secret data in a stored video file.
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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)
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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

Languages

Chinese (Native)

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