

# Fang Chen

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## EDUCATION BACKGROUND

09/2016~ 06/2020 Chongqing University of Posts and Telecommunications

Major: Electrical Engineering

GPA: 89.57/100 (3.84/4.0)

Rank: 1/88

Core Courses: Signal Processing, Computer Vision, Computer Graphic, Computer Network

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## RESEARCH EXPERIENCE

### Image Processing

- **11/2019~Now Image Manipulation Detection** (School-level Scientific Research Project)
  - RGB features are not always the best source for extracting tampered features because it contains much more continuous information than discrete information. However, sometimes discrete information is more significant for detecting manipulations.
  - Based on two-stream Faster R-CNN, we proposed a bit recombined network to adaptively balance the proportion of these two portions through learning features from bit planes of each image.
  - Validating on NIST16 dataset, our method performs better on F1 score (improved from 0.722 to 0.928) than state-of-the-art methods. On Columbia dataset, it performs better on AUC (improved from 0.858 to 0.914). On COVER dataset, it performs better both on F1 score (improved from 0.437 to 0.492) and AUC (improved from 0.817 to 0.826).
- **03/2019~08/2019 Research of Face Anti-spoofing based on Multi-layer Domain Adaptation**  
**Achievement:** The paper of **Face Anti-spoofing based on Multi-layer Domain Adaptation** was accepted by *IEEE International Conference on Multimedia & Expo* on August 2019.
  - Face anti-spoofing detection attracts extensive attention and many methods been proposed. However, these methods perform poorly in cross scenes.
  - We proposed a face anti-spoofing detection algorithm based on domain adaptation to solve this problem. To further improve the performance, we fused low-level features with high-level features of convolutional neural network for face anti-spoofing detection.
  - Validating on Replay-Attack Database, our method has the lowest EER (reduced from 0.4 to 0.3) and HTER (reduced from 0.8 to 0.6). Evaluation on cross scenes, when the model is trained on Replay-Attack Database and tested on CASIA Face Anti-Spoofing Database, our method has the best HTER (reduced from 0.354 to 0.343).

### Bio-Image Processing

- **11/2018~08/2019 Correction Algorithm Design of Ring Artifacts Based on Energy Spectrum Detector**  
**Achievement:** Chinese Patent NO.201910356591.9 issued at Apr. 2020
  - CT reconstruction technology has been widely applied in the field of medical radiological diagnosis while ring artifact is the main problem unfavorably influenced the quality of reconstructed images. However, there are some flaws in current correction algorithms, such as incomplete artifact correction and image distortion.
  - Aiming to the fan-beam filtering back-projection algorithm, we proposed a multi-region segmentation algorithm for ring artifact correction to fix reconstructed images.
  - Reconstructed images corrected by our method performs  $\pm 0.584 \sim \pm 0.741$  on Image Uniformity ( $\leq \pm 3$  stipulated by China National Standard) and  $\pm 0.0006\% \sim \pm 0.0056\%$  on Local Noise Analysis ( $\leq \pm 0.35\%$  stipulated by China National Standard).

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## HONORS & AWARDS

### Academic

- 06/2019 **Second Prize** in the 16<sup>th</sup> “Challenge Cup” Extracurricular Academic Science and Technology Work Competition for National College Students in China
- 06/2019 **“Gongjin” Scholarship** in 2018-2019 Academic Year (Only top 0.1% students awarded)
- 06/2018 **First-Class Academic Scholarship** in 2017-2018 Academic Year (Only top 1% students awarded)
- 06/2017 **First-Class Academic Scholarship** in 2016-2017 Academic Year (Only top 1% students awarded)

### Data Analysis/Mathematic Modeling

- 08/2019 **Winning Prize** in the 2019 Big Data Challenge of China University Computer Competition
- 07/2019 **Silver Award** and **Best Report** in IEEE ISI World Cup 2019 respectively (IWC 2019)
- 11/2018 **First Prize** of Mathematical Contest in Modeling for National College Students (Chongqing Division)
- 04/2018 **Honorable Mention** of 2018 Mathematical Contest in Modeling (MCM) by COMAP
- 12/2017 **Second Prize** of Asia and Pacific Mathematical Contest in Modeling (APMCM) in 2017

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## PROFESSIONAL SKILLS

- **Programming Languages and Tools:** Python, MATLAB, C/C++, JavaScript, Latex
- **Deep Learning Toolkits:** tensorflow, keras