Dongwen Gan

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Education

Xidian University — **Xi'an, Shaanxi, China**
M.Sc in Instrument Science and Technology — *Aug. 2020 – Jun. 2023*

Xidian University — **Xi'an, Shaanxi, China**
B.Eng in Detecting Guidance and Control Technique — *Aug. 2016 – Jun. 2020*

Publications

- D. Gan, L. Quan, F. Zhu, K. Xie, J. Bai, *Orthogonal modulation based light beam induced current method for anti-noise defect detection in photovoltaic cells*, Solar Energy, 2022. [Link]
- F. Zhu, K. Xie, L. Quan, D. Gan, *Multispectral compressive light beam induced current method for photovoltaic cell assessment*, Solar Energy, 2024 [Link]
- F. Zhu, K. Xie, L. Quan, D. Gan, S. Zhao, *The fast compressed light-beam-induced current method for solar cells detection based on the structural random matrix*, Submitted to Solar Energy
- F. Zhu, K. Xie, D. Gan, L. Quan, J. Zhu, *Pseudo-Random Sequence Coded Electroluminescence Imaging for photovoltaic module Inspection under Strong Environmental Light*, Submitted to IEEE Journal of Photovoltaics
- *A design method for low frequency magnetic receiving antennas*, CN114122708B, 2022-11-29
- *Orthogonal modulation-based current map detection method for photovoltaic cells*, CN113824400B, 2023-08-22
- *A real time dual kernel single machine hardware-in-the-loop simulation architecture and method*, CN112131741B, 2024-01-30

Research Experience

Deep Learning-based Compressed Sensing

Project Leader — *Oct. 2023 – Present*

- Aim to improve the accuracy and speed of image compressed sensing reconstruction, we utilize data-driven method to enhance prior information and unfolding neural network to speed up reconstruction.
- We explore the relation between different channel of image and use cross attention to improve accuracy of recover image. We apply modified attention to realize a more compact network.
- To address the quadratic computational complexity introduced by attention mechanisms, we explored an efficient information modeling method based on Mamba, which features linear complexity.
- I oversee the development and ongoing maintenance of a multi-user online server platform.

Compressed Sensing-based Photovoltaic Detection

Project Leader, Xidian University — *Aug. 2020 – Jun. 2023*

- Aiming for improving the efficiency and robustness of defect detection in photovoltaic cells, we proposed compressed sensing-based light beams induced current (LBIC) method and system.
- Built low-noise photovoltaic defect detection platform, and realized orthogonal modulation based LBIC method for noise immunity-sensing.
- Realized perturbed compressed sensing-based image reconstruction algorithm by proximal gradient method and alternating direction method of multiplier, achieving robust compressive detection.
- Proposed multi-spectral compressed sensing algorithm to obtain multiple spectral response of photovoltaic cells.
- One journal paper has been published, and another is undergoing major revisions and the graduate thesis passed

Intelligent Communication System for Aircraft

Key Contributor, Xidian University & Beijing Skywalk Technology Co., Ltd. — *Aug. 2020 – Jun. 2023*

- Aim to empowering the next generation of intelligent aircraft communication systems, we addresses challenges in the application of new technologies, leveraging existing industrial technologies for low-cost, rapid iteration of aircraft devices. My primary focus is on in-cabin wireless communication, wireless power transfer, and onboard central computer for rocket.
- Utilizing ultra wide band (UWB) wireless communication technology, we solve some wireless communication challenges including high-rate transmission (camera data), time-sensitive transmission (synchronous data), high-

reliable transmission (instruction data) and wireless networking (hard to realize by wire communication). We also solve problem of wireless power and proposed unified core communication framework for missile-borne computer
- All devices are verified through aerospace experiment and flight missions

Industrial Experience

Smart Home / Building Automation System

Application Engineer, STMicroelectronics, Shenzhen, CN *Jul. 2023 – Present*

- Served as an Application Engineer, aims to build the ecosystem of ST product, where I was chiefly responsible for designing new demos, conducting proof-of-concept validations, and providing technical support services.
- Specialized in embedded development and designed a KNX based smart home/building automation system.
- Our smart KNX EV charging station management system won the prize of top 30 digital intelligence application award, grant by Guangzhou Electrical Building Technology Committee and Alighting Award Committee.

Honors and scholarships

- 2022 National Scholarship, Ministry of Education of the People's Republic of China
- 2019 National Encouragement Scholarship, Department of Education of Shaanxi Province
- 2022 CASC Scholarship, China Aerospace Science and Technology Corporation (CASC).
- 2019 National Undergraduate Electronics Design Contest, Department of Education of Shaanxi Province
- 2022 Academic English Communication and Writing Skills Program, Cambridge, Upper Second Class.

Skills

Research Field: Deep learning, Image compressed sensing, Communication prototype

Embedded Development: MCU and FPGA application

Circuit Design: PCB design, Circuit debug

Programming Language: Python, C, MATLAB, Verilog

Language: English (IETLS)