Han Wang

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EDUCATION

Nanjing University Nanjing, China

***M.E.**, College of Engineering and Applied Science (CEAS)* 09.2018-06.2021

Advisor: Prof. Xiaoshun Jiang

Research Areas: Optical frequency comb, optical microresonators, nonlinear optics, integrated photonics.

Master's Thesis: Dispersion Measurement and 1 μm Band Optical Frequency Comb Generation Based on Silica Microdisk Cavities

Harbin Institute of Technology Harbin, China

***B.E.**, School of Electrical Engineering and Automation* 09.2014-06.2018

Major: Optoelectronic Information Science and Engineering (Optoelectronic Instrument)

Advisor: Prof. Weibo Wang

Grade: 87.84/100, **Ranking:** 9/45.

Bachelor's Thesis: Kerr Optical Frequency Combs Generation in Silica Disk Microcavity

INTERN EXPERIENCES

AI Lab, Tencent Shenzhen, China

Technical Research Intern 04.2021-01.2022

Mentor: Dr. Jun Liao

Research Areas: Hyperspectral and multispectral imaging, medical image processing, artificial intelligence.

ACADEMIC EXPERIENCES

04.2021-01.2022: Conducting research on **Multispectral, Hyperspectral Imaging and Artificial Intelligence for Medical Image Processing** at *AI Lab, Tencent*.

Advisor: Dr. Jun Liao

Project: Multispectral and Hyperspectral Imaging for Clinical Diagnosis

- Developed novel intelligent imaging systems to assist doctors in clinical diagnosis using multispectral, hyperspectral imaging and artificial intelligence methods.
- Mainly responsible for designing, building and testing multispectral imaging systems; guiding doctors to use these systems, and assisting doctors to do experiments; processing and analyzing spectral images using artificial intelligence methods; designing and simulating microscope systems; organizing experimental data and uploading it to the cloud regularly.

11.2017-04.2021: Conducted research on **Generation and Applications of Microcomb based on Silica Microresonators** at *College of Engineering and Applied Science, Nanjing University*.

Advisor: Prof. Xiaoshun Jiang

Project 1: Generation and Stabilization of Soliton Microcomb at 1550nm Band

Project 2: Kerr Frequency Comb Generation at 780nm and 1050nm Bands

Project 3: Depression Simulation and Measurement of Optical Microresonators

Project 4: Optical Imaging Based on Kerr and Soliton Microcomb (only simulation!)

- Generated soliton and soliton crystal at 1550nm band, Kerr microcomb at 780 and 1050nm band; stabilized soliton microcomb through locking pump laser frequency based on PDH locking technique; simulated and measured cavity depression of silica microcavity; simulated dynamics of microcomb generation using LLE model; investigated applications of optical frequency comb for optical imaging and performing numerical simulations.
- Mainly responsible for optical experiments (Q measurement, dispersion measurement, microcomb generation and characterization); finite element simulation of cavity depression, numerical simulation of microcomb generation dynamics and microcomb-based imaging methods; designing and building microcomb generation, characterization and stabilization systems, dispersion measurement systems, optical coupling system from free space to fiber and optical frequency doubling system; programming for instruments to remote control and data acquisition (including: optical spectrum analyzer, lasers, oscilloscope, arbitrary wave generators and linear DC power supplies); designing machine elements.

07.2016-06.2017: Conducting research on **Fourier Ptychography Microscopy** (FPM, a recently developed computational imaging method with both large field-of-view and high spatial resolution) at *Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology*.

Advisor: Dr. He Zhang and Prof. Jian Liu

Project: Imaging Property Improvement of FPM for Depth of Field, Time Resolution and Spatial Resolution

- Extend the depth of field of FPM combining wavefront coding technique based on cubic-phase-modulation phase mask and DMD; decreased images processing time through parallel computing; decreased images capturing time or improved spatial resolution through illumination modulation using LCD.
- Mainly responsible for principle simulation, experiments, building optical imaging systems based on SLM, DMD and LCD, programming to data acquisition and image processing.

02.2015-07.2015: Conducting research on **Confocal Microscopy** at *Center of Ultra-precision Optoelectronic Instrument Engineering, Harbin Institute of Technology*.

Advisor: Dr. He Zhang and Prof. Jian Liu

Project: Principle and Application of Differential Confocal Microscope System (the Freshman Year Project, ranking 1/2).

- Designed and built a differential confocal microscope system with 15nm axial resolution and three-dimensional scanning imaging, including optics, electronics, mechanics and control.
- Mainly responsible for building optical setups, writing control, data acquisition and processing program using LabVIEW, as well as testing the microscope system.

PUBLICATION

4. L. Zhang*, J. Liao*, **H. Wang**, M. Zhang, D. Han, C. Jiang, Z. Jia, Y. Liu, C. Qin, H. Bu, J. Yao, Y. Liu, "*Shortwave infrared hyperspectral imaging improves the accuracy of pathological sampling of multiple cancer species*", submitted (2022).

3. M. Zhang*, J. Liao*, Z. Jia, C. Qin, L. Zhang, **H. Wang**, Y. Liu, C. Jiang, M. Han, J. Li, K. Wang, X. Wang, H. Bu, J. Yao, Y. Liu, "*High dynamic range dual-modal white light imaging system improves the accuracy of tumor bed sampling after neoadjuvant therapy for breast cancer*", under review (2022).

2. J. Liao, X. Chen, G. Ding, P. Dong, H. Ye, **H. Wang**, Y. Zhang, J. Yao, "*Deep learning-based single-shot autofocus method for digital microscopy*", **Biomedical Optics Express**, 13: 314-327 (2022).

1. J. Gu, J. Liu, Z. Bai, **H. Wang**, X. Cheng, G. Li, M. Zhang, X. Li, Q. Shi, M. Xiao, and X. Jiang, "*Dry-etched ultra-high-Q silica microdisk resonators on a silicon chip*", **Photonics Research**, 9: 722-725 (2021).

SELECTED SKILLS

Programming: MATLAB, LabVIEW, Python, C++, Qt, Verilog HDL, Mathematica.
Hardware: NI Data Acquisition Hardware, Arduino, Raspberry Pi, FPGA, Industrial Camera, 3D Camera.
Software: Multisim, COMSOL Multiphysics, ZEMAX, ENVI, SolidWorks, AutoCAD, Origin, GraphPad, Adobe Illustrator.

HONOURS & AWARDS

1. School level "Merit Student" honorary title, 2016
2. Virtual Instrument Scholarship-Group Award (ranking 2/4), 2016
3. Bronze Award in *the 7th Harbin Institute of Technology "ZuGuang Cup" Creativity, Innovation and Entrepreneurship Competition* (ranking 4/4), 2017
4. Third Prize in *the 4th National Virtual Instrument Competition* (ranking 1/5), 2017

TEACHING ASSISTANT

Practical Training of Optoelectronic Information Engineering, with Associate Prof. Shun Wang, autumn semester 2020, *Nanjing University*.