

XIAO CHEN

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RESEARCH INTERESTS

Computational Imaging; Super-resolution; AI Optics; Image Signal Processing

EDUCATION

Tokyo Institute of Technology , Ph.D. student	Expected 2023/9
<i>Masahiro Yamaguchi Lab, Information and Communications Engineering</i>	
Tokyo Institute of Technology , M.E.	2018 - 2020
<i>Masahiro Yamaguchi Lab, Information and Communications Engineering</i>	
University of Electronic Science and Technology of China , B.E.	2014 - 2018
<i>Spatial Informatics and Digitalized Technology</i>	

SKILLS

Technical Skills	Python (Pytorch, OpenCV), Matlab, C
Language	Chinese (native), English (Business), Japanese (Daily conversation)

EXPERIENCE

Sony AI Lab	Dec 2022 - Now
Research Intern	Tokyo, Japan

- AI-based object detection with Bayer image.

Axera	Sep 2022 - Nov 2022
ISP Algorithm Engineer (Intern)	Tokyo, Japan

- Pre research on AI-based joint Demosaicking and Super-resolution.

DJI	Apr 2022 - Jun 2022
Algorithm Engineer (Intern)	Tokyo, Japan

- Make contributions to the camera emulator system and improve the calculation efficiency.

PROJECTS

Wave-optics based image super-resolution in computational camera	Jan 2019 - Now
Ph.D. thesis research (co-research with Hitachi Ltd.,)	

- Research on a coded-aperture-based lensless camera (Camera using coded aperture with image sensor, without optical lens) based on wave optics theory.
- Increase the resolution to over 2 times by multi-images synthesized method under diffraction influences.
- Studies on 3D reconstruction and a wider field of view are ongoing.

Waveguide device based computational see-through screen camera	Dec 2020 - Sep 2021
RA research (Yamaguchi Lab)	

- Propose a prototype computational see-through camera using Holographic optical elements (HOE) based waveguide device.
- Do the ray-tracing-based analysis on the imaging model and propose a denoising method.

FUNDINGS AND HONORS

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| • JPMJSP2106 (Japan Science and Technology Agency) | Sep 2021 - Sep 2023 |
| • Outstanding Presentation Award (Optics & Photonics Japan, 2022, Utsunomiya) | Nov 2022 |
| • The Telecommunications Advancement Foundations | Sep 2021 |

• Journal Articles

1. **Xiao Chen**, Xiuxi Pan, Tomoya Nakamura, Saori Takeyama, Takeshi Shimano, Kazuyuki Tajima, and Masahiro Yamaguchi, “Wave-optics-based image synthesis for super resolution reconstruction of FZA lensless camera,” (Under review in *Opt. Express*)
2. **Xiao Chen**, Noriyuki Tagami, Hiroki Konno, Tomoya Nakamura, Saori Takeyama, Xiuxi Pan, and Masahiro Yamaguchi, “Computational see-through screen camera based on a holographic waveguide device,” *Opt. Express*, 30, 25006-25019 (2022)
3. Xiuxi Pan, **Xiao Chen**, Saori Takeyama, and Masahiro Yamaguchi, “Image reconstruction with transformer for mask-based lensless imaging,” *Opt. Lett.*, 47, 1843-1846 (2022)
4. Xiuxi Pan, **Xiao Chen**, Tomoya Nakamura, and Masahiro Yamaguchi, “Incoherent reconstruction-free object recognition with mask-based lensless optics and the Transformer,” *Opt. Express*, 29, 37962-37978 (2021)
5. Xiuxi Pan, Tomoya Nakamura, **Xiao Chen**, and Masahiro Yamaguchi, “Lensless inference camera: incoherent object recognition through a thin mask with LBP map generation,” *Opt. Express*, 29, 9758-9771 (2021)
6. Tomoya Nakamura, Takuto Watanabe, Shunsuke Igarashi, **Xiao Chen**, Kazuyuki Tajima, Keita Yamaguchi, Takeshi Shimano, and Masahiro Yamaguchi, “Superresolved image reconstruction in FZA lensless camera by color-channel synthesis,” *Opt. Express*, 28, 39137-39155 (2020)

• International Conferences

1. **Xiao Chen**, Xiuxi Pan, Tomoya Nakamura, Saori Takeyama, and Masahiro Yamaguchi, “A wave-optics based superresolution method in FZA lensless camera by image synthesis from different mask patterns,” *OSJ-OSA-OSK Joint Symposia on Optics*, 2022, 14aBJ3.
2. **Xiao Chen**, Tomoya Nakamura, Xiuxi Pan, Kazuyuki Tajima, Keita Yamaguchi, and Masahiro Yamaguchi, “Resolution Improvement In FZA Lens-Less Camera By Synthesizing Images Captured With Different Mask-Sensor Distances,” *Proceedings of IEEE International Conference on Image Processing (ICIP)*, 2021, pp. 2808-2812.
3. Masahiro Yamaguchi, Noriyuki Tagami, **Xiao Chen**, Hiroki Konno, and Tomoya Nakamura, “Computational see-through screen camera using a holographic waveguide device,” *OSA Imaging and Applied Optics Congress*, 2021, paper DF2F.6.
4. **Xiao Chen**, Tomoya Nakamura, Xiuxi Pan, Kazuyuki Tajima, Keita Yamaguchi, and Masahiro Yamaguchi, “Resolution enhancement in FZA lens-less camera using images captured with different mask-sensor distances,” *OSJ-OSA-OSK Joint Symposia on Optics*, 2020, 15aAJ3.