My Resume

Name: Yuki (First Name) Saito (Last Name)

Date of Birth: 15 (Date) October (Month) 1997 (Year (mm / dd / yyyy))

Nationality: Japan Sex: male

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Language Ability:

English (☐ beginner ☑ intermediate ☐ advanced)
Chinese (☑ beginner ☐ intermediate ☐ advanced)
French (☐ beginner ☑ intermediate ☐ advanced)

Education (from high school):

Year to Year		Name of School (and Department / Major)
April 2013 – March 2016	:	Bunsei university of art high school (Tochigi, Japan)
April 2016 – March 2020	:	Keio university (the faculty of computer science, engineering and science/ the department of information and computer science)
April 2020 – September 2022	:	Keio university graduate school (the faculty of computer science, engineering and science/ School of Science for Open and Environmental Systems)
September 2020 – September2022	:	Ecole Centrale de Nantes (Master course of Control and Advanced Robotics)

Work Experience*1:

- May 2016 – May2020: Teaching assistant at Tousin high school Co., Ltd. Tokyo
- May 2017 – now: Research assistant at Gendai mobility research institute in Toyota Co., Ltd. Tokyo
- Aug 2019 – May 2020: Image processing engineer at ExMedia Co., Ltd. Tokyo
- Aug 2020 – Sep 2020: Summer internships at Sony groups, software engineer of mobile camera
- Aug 2020 – now: Researcher at Keio university, School of Medicine, Plastic surgery group (paid)
- Apr 2020 – now: Teaching assistant at McKids Co, Ltd. Tokyo
- Aug 2021: Summer internships at Mizuho securities, global investment banking division
- Aug2021 : Summer internships at Nomura Research Institute

*1: including internships longer than 1 weeks.

Overseas Experience*2

- Sept 2020 – Sept 2021: Double degree program at Ecole Central de Nantes (France, Nantes)

*2: stay of two months or more

Extracurricular Activities:

2016 – 2020 : Work as public relations department member in kyousaibu, an official organization in Keio university
- Real estate brokerage for students in Keio university
- Part-time job introduction for students in Keio university

2018 – 2019: Work as a member of habitat for Humanity in Japan 2018
- Dispatched to Danang, Vietnam to build habitation for local people

2019 summer : Achieved cross country tour in the United States by fund raising
- Gained about $7500 in Japan and U.S.
- Held calligraphy performance at 20 cities in United States

Lab information:

- 2019 – now : Hyper Vision Research Laboratory at Keio university, supervised by Prof.Hideo Saito
- 2020 – now : LS2N Armen team at Ecole Cenral de Nantes, supervised by Prof.Vincent Frémont

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Research interest:

- Medical image analysis, health saving AI
- Computer vision (3D robot vision, object recognition with machine learning)

Academic Achievement:

- Yuki Saito, Ryo Fuji, Daiki Matsuno, Zhu Zhao, horarable mention at The 3rd World Intelligence Congress, Tianjin, China, 2019
- Yuki Saito, Ryo Hachiuma, Masahiro Yamaguchi, and Hideo Saito, In-Plane Rotation-Aware Monocular Depth Estimation using SLAM, The International Workshop on Frontiers of Computer Vision (IW-FCV), February 2020.
- Yuki Saito, Ryo Hachiuma, Masahiro Yamaguchi, and Hideo Saito, Training-free Approach to Improve the Accuracy of Monocular Depth Estimation with In-Plane Rotation, IEICE Transactions on Information and Systems, 2021
- 齋藤祐貴，八馬遼，山口真弘，斎藤英雄，SLAM を用いた Roll 方向回転に頑健な単眼 depth 推定の精度改善手法，第 222 回コンピュータビジョンとイメージメディア(CVIM)研究会，2020 年 5 月 15 日発表済． [優秀賞]
- Yuki Saito, Ryo Hachiuma, Hideo Saito, Hiroaki Kajita, Yoshifumi Takatsume, Tetsu Hayashida, Camera Selection for Occlusion-less Surgery Recording via Training with an Egocentric Camera, IEEE Access, 2021, doi 10.1109

Research theme:

[1] Occlusion-less surgery recording system with multiple cameras on surgical lump.

Recoding surgery is indispensable task for various situations, such as education of medical students and evaluation of medical treatments. However, capturing targets such as the surgical field, surgical tools, and the surgeon's hands, is almost impossible since these targets are heavily occluded by the surgeon's head and body during a surgery. We invented the recording system in which multiple cameras are installed in the surgical lump, supposing at least one camera would capture the target without occlusion. As this system records multiple video sequences, we need to select the best view camera automatically.

I proposed the camera selection algorithm with convolutional neural network (CNN) in a self-supervised manner. I focused on the eye tracker mounted on the surgeon's head, which can capture the recording targets without occlusion. Employing this first-person-view videos, my approach selects the best-view camera mounted on a surgical lump by choosing the camera whose view is most similar to the first person-view image at that moment. Different from conventional fully supervised approaches for this camera selection task, my approach is based on a self-supervised manner and does not need manual annotation for multiple cameras on the surgical lump to create the training data.

Figure1: surgical lump with multiple cameras

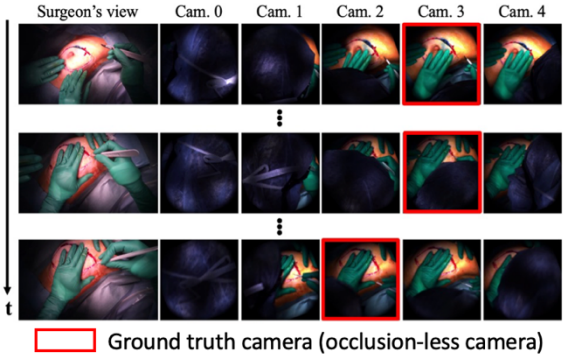

Figure2: Surgeon's first-person views and multiple camera views

[2] Improving the accuracy of Monocular depth estimation for tilted images with RGB-SLAM.

Monocular depth estimation is a task to estimate a depth from a single RGB image, and this technology is widely used in computer vision applications such as Autonomous driving, UAV navigation, and smartphone AR/VR apps. In conventional depth estimation approaches using CNN, the distribution of camera poses in training datasets are limited and most of them are composed of gravity aligned images (no roll rotated images). So, if tilted images containing large roll camera rotations are input into CNN, the accuracies of estimated depth maps are significantly dropped. In situations where camera devices are freely handled and people may capture roll rotated scenes, this would cause a crucial problem.

To prevent this problem, I proposed a rectification method to estimate a plausible depth of tilted images with RGB-SLAM. RGB-SLAM is a system to estimate camera poses accurately with only RGB frames. By using this tracking, I extracted the roll angles of the estimated camera poses and apply homography transformation on original images. Then, the transformed images which has no roll rotation were input into CNN depth estimation networks, and I can get the rectified depth map by applying inverse transformation. To the best of my knowledge, this was the first system to improve the accuracy of monocular depth estimation for tilted images with only RGB information. My proposed method can work with only RGB camera frames and does not rely on other functional sensors like IMU.

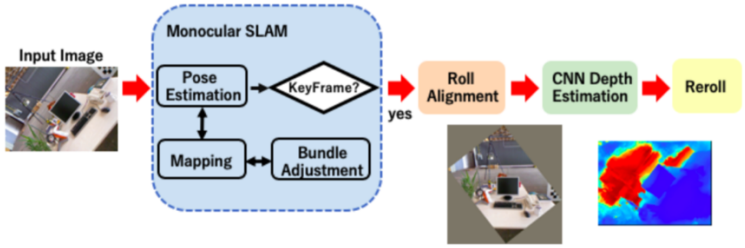

Figure3: The overview of our system using RGB-SLAM