

# Tsubasa HIRAKAWA

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## EDUCATION

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- Since 2014 **Enrolling Ph.D. Information Engineering:** Graduate School of Engineering, Hiroshima University, Japan  
Supervisor: Toru TAMAKI
- 2012 – 2013 **M.S. Information Engineering:** Graduate School of Engineering, Hiroshima University, Japan  
Supervisor: Toru TAMAKI
- 2008 – 2012 **B.S. Engineering:** Department of Electrical, Computer and Systems Engineering, Faculty of Engineering, Hiroshima University, Japan  
Supervisor: Toru Tamaki

## PROJECTS

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- Since 2012 **Recognition of Colorectal Cancer Images of NBI Endoscopy**  
Objective: Constructing a quantitative computer-aided diagnosis system for colorectal cancer by using NBI endoscopic images and applying clinical diagnosis.  
Funding: JSPS KAKENHI Grant Numbers 14J00223, 30243596, and 00335689.  
Project leader: Shigeto YOSHIDA

## INTERESTS

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Computer Vision, Pattern Recognition, Machine Learning, Image Processing

## PUBLICATIONS

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### Journals

- 2016 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Yoko Kominami, Shinji Tanaka, "Defocus-aware Dirichlet particle filter for stable endoscopic video frame recognition," Artificial Intelligence in Medicine, (accepted in March 2016), DOI: <http://dx.doi.org/10.1016/j.artmed.2016.03.002>.

Yoko Kominami, Shigeto Yoshida, Shinji Tanaka, Yoji Sanomura, **Tsubasa Hirakawa**, Bisser Raytchev, Toru Tamaki, Tetsusi Koide, Kazufumi Kaneda, Kazuaki Chayama, "Computer-aided diagnosis of colorectal polyp histology by using a real-time image recognition system and narrow-band imaging magnifying colonoscopy," *Gastrointestinal Endoscopy*, Vol. 83, No. 3, pp. 643-649, Mar. 2016.

### International Conferences

- 2016 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Hiroshi Mieno, Shinji Tanaka, "Discriminative Subtree Selection for NBI Endoscopic Image Labeling," In Proc. of International Symposium on Biomedical Engineering, pp.170-171, Nov. 2016.

Takumi Okamoto, Tetsuhi Koide, Anh-Tuan Hoang, Tatsuya Shimizu, Koki Sugi, Toru Tamaki, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Hiroshi Mieno, Shinji Tanaka, "A Real-Time Feature Extraction Method for Colorectal Endoscopic Images toward Computer-Aided Diagnosis," In Proc. of International Symposium on Biomedical Engineering, pp.162-163, Nov. 2016.

Takumi Okamoto, Tetsuhi Koide, Anh-Tuan Hoang, Tatsuya Shimizu, Koki Sugi, Toru Tamaki, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Hiroshi Mieno, Shinji Tanaka, "A Real-Time Feature Transformation Method for Colorectal Endoscopic Images toward Computer-Aided Diagnosis," In Proc. of International Symposium on Biomedical Engineering, pp.164-165, Nov. 2016.

Takumi Okamoto, Tetsuhi Koide, Anh-Tuan Hoang, Tatsuya Shimizu, Koki Sugi, Toru Tamaki, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Hiroshi Mieno, Shinji Tanaka, "A Real-Time Type Identification Method for Colorectal Endoscopic Images toward Computer-Aided Diagnosis," In Proc. of International Symposium on Biomedical Engineering, pp.166-167, Nov. 2016.

Shoji Sonoyama, Toru Tamaki, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Hiroshi Mieno and Shinji Tanaka, "Transfer Learning for Endoscopic Image Classification," In Proc. of The Korea-Japan joint workshop on Frontiers of Computer Vision (FCV2016), pp.258-262, Feb. 2016.

Toru Tamaki, Shoji Sonoyama, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Hiroshi Mieno and Shinji Tanaka, "Computer-Aided Colorectal Tumor Classification in NBI Endoscopy Using CNN Features," In Proc. of The Korea-Japan joint workshop on Frontiers of Computer Vision (FCV2016), pp. 61-65, Feb. 2016.

- 2015 Shoji Sonoyama, **Tsubasa Hirakawa**, Toru Tamaki, Takio Kurita, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Yoko Kominami, Shinji Tanaka, "Transfer Learning for Bag-of-Visual Words Approach to NBI endoscopic image classification," In Proc. of the IEEE International Conference of Engineering in Medicine and Biology Society (EMBC2015), pp. 25-29, Aug. 2015.

Shoji Sonoyama, Toru Tamaki, **Tsubasa Hirakawa**, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Shigeto Yoshida, Shinji Tanaka, "Trade-off between speed and performance for colorectal endoscopic NBI image classification," In Proc. of SPIE Medical Imaging 2015, vol. 9413, Mar. 2015.

- 2014 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Shigeto Yoshida, Shinji Tanaka, "SVM-MRF segmentation of colorectal NBI endoscopic images," In Proc. of the IEEE International Conference of Engineering in Medicine and Biology Society (EMBC2014), pp.4739-4742, Aug. 2014.

- 2013 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Rie Miyaki, Taiji Matsuo, Shigeto Yoshida, Shinji Tanaka, "Smoothing posterior probabilities with a particle filter of dirichlet distribution for stabilizing colorectal NBI endoscopy recognition," In Proc. of the IEEE International Conference on Image Processing (ICIP2013), pp. 621-625, Sept. 2013.

**Tsubasa Hirakawa**, Toru Tamaki, Bisser Raychev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Yoko Kominami, Taiji Matsuo, Rie Miyaki, Shinji Tanaka, "Labeling colorectal NBI zoom- videoendoscope image sequences with MRF and SVM," In Proc. of the IEEE International Conference of Engineering in Medicine and Biology Society (EMBC2013), pp.4831-4834, Jul. 2013.

Rie Miyaki, Shigeto Yoshida, Shinji Tanaka, Yoko Kominami, Yoji Sanomura, Taiji Matsuo, Shiro Oka, **Tsubasa Hirakawa**, Bisser Raytchev, Toru Tamaki, Tsubasa Mishima, Satoshi Shigemi, Tetsushi Koide, Kazufumi Kaneda, Masaharu Yoshihara, Kazuaki Chayama, "Usefulness of magnifying endoscopy with Blue LASER Imaging for diagnosis of early gastric cancer," American Society for Gastrointestinal Endoscopy (ASGE) 2013, May 18-21 2013, Orlando.

Yoko Kominami, Shigeto Yoshida, Shinji Tanaka, Rie Miyaki, Yoji Sanomura, Taiji Matsuo, Hiroyuki Kanao, Shiro Oka, **Tsubasa Hirakawa**, Tsubasa Mishima, Satoshi Shigemi, Bisser Raytchev, Toru Tamaki, Tetsushi Koide, Kazuhumi Kaneda, Kazuaki Chayama, "Quantitative analysis of NBI magnifying colonoscopy images based on Bag-of-Features for diagnosis of colorectal tumors," American Society for Gastrointestinal Endoscopy (ASGE) 2013, May 18-21 2013, Orlando.

### Domestic Conferences, Symposia and Workshops (in Japanese)

- 2016 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, "Discriminative Subtree Selection for Texture Segmentation," In Proc. of 19th Meeting on Image Recognition and Understanding (MIRU2016), 2016.

Shoji Sonoyama, **Tsubasa Hirakawa**, Toru Tamaki, Takio Kurita, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Shigeto Yoshida, Hiroshi Mieno, Shinji Tanaka, "Transfer Learning for NBI Endoscopic Image Classification," IEICE technical report, MI2015-119, pp. 223-227, Jan. 2016.

- 2014 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Shinji Tanaka, "Image segmentation for NBI endoscopic images using SVM and MRF," In Proc. of 17th Meeting on Image Recognition and Understanding (MIRU2014), 2012.

- 2013 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Rie Miyaki, Taiji Matsuo, Shigeto Yoshida, Shinji Tanaka, "Image Segmentation for NBI Endoscopy Image," IEICE technical report, MI2013-53, Vol.113, No.281, pp. 39-43, Nov. 2013.

**Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Rie Miyaki, Taiji Matsuo, Shigeto Yoshida, Shinji Tanaka, "Dirichlet distribution Particle Filter for Posterior probability Smoothing ~Application for NBI Videoendoscopy~, " IEICE technical report, MI2012-100, Vol. 112, No. 411, pp. 201-206, Jan. 2013.

- 2012 **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Yoshito Take-mura, Keiichi Onji, Rie Miyaki, Shinji Tanaka, "Temporal Labeling NBI Videoendoscopy with MRF," In Proc. of 15th Meeting on Image Recognition and Understanding (MIRU2012), pp. IS3-29-1-IS3-29-6, 2012.

**Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Yoshito Take-mura, Keiichi Onji, Rie Miyaki, Shinji Tanaka, "Labeling an image sequence of NBI videoendoscopy with MRF and DP," IEICE technical report, MI2012-30, Vol. 112, No. 142, pp. 47-52, Jul. 2012.

Daichi Yokota, **Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Yoshito Takemura, Keiichi Onji, Rie Miyaki, Shinji Tanaka, "Stabilization of NBI videoendoscopy," In Proc. of the 18th Symposium on Sensing via Image Information (SSII2012), pp. IS1-09-1-IS1-09-5, 2012.

**Tsubasa Hirakawa**, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Shigeto Yoshida, Shinji Tanaka, "Recognition for NBI Videoendoscopy using MRF," IEICE technical report, PRMU2011-207, Vol. 111, No. 430, pp. 115-116, Feb. 2012.

### Lectures

- 2012 **Tsubasa Hirakawa**, "The first Graph-Cut (in Japanese)," The 21th Nagoya PRML study meeting, Nov. 2012.

## GRANTS

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Since 2014 Japan Society for the Promotion of Sciences (JSPS) Young Research Fellowship (DC1)

## LANGUAGES

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Japanese Native

English Reading, writing and speaking

French Beginner

## SKILLS & EXPERTISE

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Platforms Linux, Mac OS X

Programming C/C++, R, Python, MATLAB, Unix Shell Scripting

Other skills HTML/CSS, PHP, Linux Server Administration, LaTeX