Tatsunori TANIAI

Yoichi Sato Laboratory,

The Graduate School of Information Science and Technology, the University of Tokyo

4-6-1 Komaba, Meguro-ku, Tokyo, 153-8505 JAPAN

Phone: +81-3-5452-6461 (international), 03-5452-6461 (domestic)

Mobile: +81-90-9149-2019 (international), 090-9149-2019 (domestic)

E-mail: taniai{at}iis.u-tokyo.ac.jp

EDUCATION

The University of Tokyo, JAPAN (Apr 2009 - present)

Apr 2014 - **Pursuing a Ph.D. degree** in Information Science and Technology
Advisor: Yoichi SATO

Mar 2014: **Master of Science** in Information Science and Technology
Advisor: Takeshi NAEMURA

Mar 2012: **Bachelor of Engineering** in Information and Communication Engineering
Advisor: Takeshi NAEMURA

National Institute of Technology, Tokyo College, JAPAN (2003-2009)

Mar 2009: **Associate of Engineering** in Information Engineering
Advisor: Tetsuya KOJIMA

RESEARCH INTERESTS

Include low and mid-level computer vision, particularly,

- **3D reconstruction** in both geometric and photometric approaches.
- **MRF optimization** for higher-order energies or a large label space.

RESEARCH PROJECTS

The University of Tokyo, JAPAN

Optimization Method for Binary Variable Energies (2014 -) [2]

Propose an optimization method for binary variable energies used in *e.g.* image segmentation and banalization. The method can be applied to broad classes of higher-order and pairwise non-submodular energies.

Stereo Matching using Continuous Markov Random Fields and Graph Cuts (2012 -) [4]

Propose an accurate stereo matching method that estimates a local 3D plane at each pixel. The energy function is modeled as a pairwise Markov random field with 3D plane labels, and is efficiently optimized using graph cuts.

Image Segmentation using Higher-Order Markov Random Fields (2011 - 2012) [1], [5]

Propose an image segmentation method using a higher-order Markov random field model, which robustly enforces the appearance consistencies between resulting and priori known color distributions for both foreground and background regions.

National Institute of Technology, Tokyo College, JAPAN

Blind Deconvolution of Mixed Sound Signals (2008)

Propose a blind deconvolution method for mixed sound signals. The source signals are assumed stochastically independent, and the problem is cast as independent component analysis in the frequency domain.

AWARDS & HONORS

October 2015: **Microsoft Research Asia Fellowship**
from Microsoft Research Asia

2014 - 2017: **JSPS Young Research Fellowship (DC1)**
from the Japan Society for the Promotion of Science

March 2014: **Dean's Award for Best Master Thesis**
from the Graduate School of Information Science and Technology, the University of Tokyo

March 2012: **Dean's Award for Best Bachelor Thesis**
from the Faculty of Engineering, the University of Tokyo

PUBLICATIONS

♦ **Journals**

[1] Tatsunori TANIAI, Viet-Quoc Pham, Keita TAKAHASHI, and Takeshi NAEMURA: "Image Segmentation using Simultaneous Matching of Foreground-Background Color Distributions," *IEICE Transactions on Information and Systems (Japanese edition)*, vol. J96-D, no. 8, pp. 1764–1777 (Aug 2013).

♦ **International Conference Papers**

[2] Tatsunori TANIAI, Sudipta Sinha, and Yoichi SATO: "Joint Recovery of Dense Correspondence and Cosegmentation in Two Images," In *Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR 2016**), Las Vegas, NV, US (Jun 2016).
[acceptance rate: 643/2145 = 29.9%]

[3] Tatsunori TANIAI, Yasuyuki MATSUSHITA, and Takeshi NAEMURA: "Superdifferential Cuts for Binary Energies," In *Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR 2015**), pp.2030–2038, Boston, MA, US (Jun 2015).
[acceptance rate: 602/2123 = 28.4%]

[4] Tatsunori TANIAI, Yasuyuki MATSUSHITA, and Takeshi NAEMURA: "Graph Cut based

Continuous Stereo Matching using Locally Shared Labels," In *Proc. of IEEE Conference on Computer Vision and Pattern Recognition* (**CVPR 2014**), pp.1613–1620, Columbus, OH, US (Jun 2014).

[acceptance rate: 540/1807 = 29.8%]

[5] Tatsunori TANIAI, Viet-Quoc Pham, Keita TAKAHASHI, and Takeshi NAEMURA: "Image Segmentation using Dual Distribution Matching," In *Proc. of British Machine Vision Conference* (**BMVC 2012**), pp.74.1–74.11, Surrey, UK (Sep 2012).

[accepted as oral; acceptance rate: 32/414 = 8%]

♦ **Invited Talks**

[6] Tatsunori TANIAI: "Solving Segmentation and Dense Correspondence Problems using Graph Cuts," *The 1st CREST Symposium on Random Fields and Deep Learning*, Waseda Univ., Tokyo, Japan (Jan 13th, 2016). (Organizers: Prof: Hiroshi Ishikawa & Prof. Takayuki Okatani)

[7] Tatsunori TANIAI, Yasuyuki MATSUSHITA, and Takeshi NAEMURA: "Invited Talks from CVPR 2015: Superdifferential Cuts for Binary Energies," *The 18th Meeting on Image Recognition and Understanding (MIRU)*, Osaka, Japan (Jul 28th, 2015).

[8] Tatsunori TANIAI, Yasuyuki MATSUSHITA, and Takeshi NAEMURA: "Invited Talks from CVPR 2014: Graph Cut based Continuous Stereo Matching using Locally Shared Labels," *The 17th Meeting on Image Recognition and Understanding (MIRU)*, Okayama, Japan (Jul 29th, 2014).

♦ **Domestic Conference Papers** (in Japanese)

Two papers including one refereed paper.

EXPERIENCES

Conference Reviewer: 3DV 2014

Journal Reviewer: IEEE TIP 2015

Research Internship at Microsoft Research Asia (Jan 26th – Apr 25th, 2016)

Supervisor: Dr. David Wipf

Research Internship at Microsoft Research (June 1st – Sep 4th, 2015)

Supervisor: Dr. Sudipta Sinha

Part of the internship achievements has been published as a CVPR 2016 paper [2].

Research Internship at Microsoft Research Asia (Dec 11th, 2012 – Apr 17th, 2013)

Supervisor: Dr. Yasuyuki Matsushita

Part of the internship achievements has been published as a CVPR 2014 paper [4].

SKILLS

- 10+ years of programming experiences in **C++**, **C#**, and **Java**
- Visual computing using **OpenCV**, **MATLAB** and **Python**
- GPGPU programming skills using **OpenCL** and **CUDA**

- Academic literacy & conversation skills in **English.** (TOEIC 930 in May 2011)