**Ryuji Hirayama**

**1-33 Yayoi-cho, Inage-ku, Chiba 263-8522, Japan**

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**+81-43-290-3356**

**Education**

**Ph.D., Engineering 04/2014 – 03/2017**

Graduate School of Engineering, Chiba University, Japan

Theme: Volumetric display containing multiple 2D images

Advisor: Professor Tomoyoshi Ito

**M.S., Engineering 04/2012 – 03/2014**

Graduate School of Engineering, Chiba University, Japan

**B.S., Engineering 04/2008 – 03/2012**

Faculty of Engineering, Chiba University, Japan

**Experiences**

**Postdoctoral Researcher 04/2017 – present**

Graduate School of Engineering, Chiba University, Japan

Advisor: Professor Tomoyoshi Ito

**Research Fellow 04/2015 – present**

Japan Society for the Promotion of Science

Theme: Volumetric Display Exhibiting Multiple 2D Information

Advisor: Professor Tomoyoshi Ito

**Research Assistant of the ImPACT Program 11/2014 – 03/2015**

Graduate School of Engineering, Chiba University, Japan

Theme: Acceleration of a Cell Searching Algorithm for the Serendipiter

Project Leader: Professor Tomoyoshi Shimobaba

**Teaching Assistant 10/2014 – 03/2015**

Faculty of Engineering, Chiba University

Lecture: Experiment of Electrical and Electronics Engineering III

**Student Assistant 07/2013 – 10/2014**

Academic Link Center, Chiba University

Job: Leaning Support for Undergraduate Students

**Research Grants**

**Grant-in-Aid for JSPS Fellows, No. 16J30007 04/2016 – present**

Japan Society for the Promotion of Science

2,300,000 JPY / 2 years

**Grant-in-Aid for JSPS Fellows, No. 15J07684 04/2015 – 03/2016**

Japan Society for the Promotion of Science

1,200,000 JPY / 1 year

**Honors and Awards**

**President Award for the Excellent Record 03/2017**

Chiba University

**Dean Award for the Excellent Record 03/2017**

Graduate School of Engineering, Chiba University

**Global Prominent Research Program to Support Sending Graduate Students Abroad 12/2016**

Chiba University

**Program to Support Sending Graduate Students Abroad 10/2016**

Chiba University

**JSPS Ikushi Prize 03/2016**

Japan Society for the Promotion of Science

**KONICA MINOLTA Science and Technology Foundation Award 06/2015**

The Optical Society of Japan

**Best Poster Award (FORUM 8 Award) 03/2015**

Computer Graphic Arts Society

**Scholarship Loan Forgiveness for Academic Excellence (Full Amount) 05/2015**

Japan Student Services Organization

**Outstanding Paper Award for Young C&C Researchers 01/2015**

NEC C&C Foundation

**Program to Support Sending Graduate Students Abroad 05/2014**

Chiba University

**Grants for Researchers Attending International Conferences 05/2014**

NEC C&C Foundation

**Scholarship Loan Forgiveness for Academic Excellence (Full Amount) 05/2014**

Japan Student Services Organization

**President Award for the Excellent Record 03/2014**

Chiba University

**Dean Award for the Excellent Record 03/2014**

Graduate School of Engineering, Chiba University

**Journal Papers**

1. **R. Hirayama**, T. Suzuki, T. Shimobaba, A. Shiraki, M. Naruse, H. Nakayama, T. Kakue, T. Ito, Inkjet printing-based volumetric display projecting multiple full-colour 2D patterns, Scientific Reports, 7, 46511 (2017).
2. T. Shimobaba, Y. Endo, **R. Hirayama**, Y. Nagahama, T. Takahashi, T. Nishitsuji, T. Kakue, A. Shiraki, N. Takada, N. Masuda, T. Ito, Autoencoder-based holographic image restoration, Applied Optics, 56(13), F27-F30 (2017).
3. T. Shimobaba, Y. Endo, **R. Hirayama**, D. Hiyama, Y. Nagahama, S. Hasegawa, M. Sano, T. Takahashi, T. Kakue, M. O., T. Ito, Holographic micro-information hiding, Applied Optics, 56(4), 833-837 (2017).
4. **R. Hirayama**, A. Shiraki, M. Naruse, S. Nakamura, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito, Optical Addressing of Multi-Colour Photochromic Material Mixture for Volumetric Display, Scientific Reports, 6, 31543 (2016).
5. T. Shimobaba, M. Makowski, Y. Nagahama, Y. Endo, **R. Hirayama**, D. Hiyama, S. Hasegawa, M. Sano, T. Kakue, M. Oikawa, T. Sugie, N. Takada, T. Ito, Color computer-generated hologram generation using the random phase-free method and color space conversion, Applied Optics, 55(15), 4159-4165 (2016).
6. **R. Hirayama**, H. Nakayama, A. Shiraki, T. Kakue, T. Shimobaba, T. Ito, Image quality improvement for a 3D structure exhibiting multiple 2D patterns and its implementation, Optics Express, 24(7), 7319-7327 (2016).
7. T. Sanpei, T. Shimobaba, T. Kakue, Y. Endo, **R. Hirayama**, D. Hiyama, S. Hasegawa, Y. Nagahama, M. Sano, M. Oikawa, T. Sugie, T. Ito, Optical encryption for large-sized images, Optics Communications, 361, 138-142 (2016).
8. T. Shimobaba, T. Kakue, Y. Endo, **R. Hirayama**, D. Hiyama, S. Hasegawa, Y. Nagahama, M. Sano, M. Oikawa, T. Sugie, T. Ito, Improvement of the image quality of random phase-free holography using an iterative method, Optics Communications, 355, 596-601 (2015).
9. T. Shimobaba, T. Kakue, Y. Endo, **R. Hirayama**, D. Hiyama, S. Hasegawa, Y. Nagahama, M. Sano, M. Oikawa, T. Sugie, T. Ito, Random phase-free kinoform for large objects, Optics Express, 23, 17269-17274 (2015).
10. (Highlighted in Nature Japan) **R. Hirayama**, M. Naruse, H. Nakayama, N. Tate, A. Shiraki, T. Kakue, T. Shimobaba, M. Ohtsu, T. Ito, Design, Implementation and Characterization of a Quantum-Dot-Based Volumetric Display, Scientific Reports, 5, 8472 (2015).
11. D. Arai, T. Shimobaba, K. Murano, Y. Endo, **R. Hirayama**, D. Hiyama, T. Kakue, T. Ito, Acceleration of computer-generated hologram using tilted wavefront recording plane method, Optics Express, 23, 1740-1747 (2015).
12. T. Shimobaba, M. Makowski, T. Kakue, N. Okada, Y. Endo, **R. Hirayama**, D. Hiyama, S. Hasegawa, Y. Nagahama, T. Ito, Numerical investigation of lensless zoomable holographic projection to multiple tilted planes, Optics Communications, 333, 274-280 (2014).
13. T. Shimobaba, T. Kakue, N. Okada, Y. Endo, **R. Hirayama**, D. Hiyama, T. Ito, Ptychography by changing the area of probe light and scaled ptychography, Optics Communications, 331, 189-193 (2014).
14. T. Shimobaba, T. Kakue, M. Oikawa, N. Takada, N. Okada, Y. Endo, **R. Hirayama**, T. Ito, Calculation reduction method for color computer-generated hologram using color space conversion, Optical Engineering, 53(2), 024108 (2014).
15. T. Shimobaba, T. Kakue, M. Oikawa, N. Okada, Y. Endo, **R. Hirayama**, N. Masuda, T. Ito, Non-uniform sampled scalar diffraction calculation using non-uniform Fast Fourier transform, Optics Letters, 38, 5130-5133 (2013).
16. T. Shimobaba, M. Makowski, T. Kakue, M. Oikawa, N. Okada, Y. Endo, **R. Hirayama**, N. Masuda, T. Ito, Lensless zoomable holographic projection using scaled Fresnel diffraction, Optics Express, 21, 25285-25290 (2013).
17. T. Shimobaba, H. Yamanashi, T. Kakue, M. Oikawa, N. Okada, Y. Endo, **R. Hirayama**, T. Ito, Inline digital holographic microscopy using a consumer scanner, Scientific Reports, 3, 2664 (2013).
18. H. Nakayama, A. Shiraki, **R. Hirayama**, N. Masuda, T. Shimobaba, T. Ito, Three-Dimensional Volume Containing Multiple Two-Dimensional Information Patterns, Scientific Reports, 3, 1931 (2013).

**Presentations**

1. **R. Hirayama**, T. Suzuki, T. Shimobaba, A. Shiraki, M. Naruse, H. Nakayama, T. Kakue, T. Ito, Inkjet-printed 3D Structure Projecting Multiple Full-Color Images, OPIC IP2017, Yokohama, Japan (2017).
2. F. Kawashima, **R. Hirayama**, A. Shiraki, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito Gradation expression by overlap of voxels in volumetric display composed of photochromic materials, 3DSA 2016, Fukuoka, Japan (2016).
3. **R. Hirayama**, A. Shiraki, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito, 3-D crystal with a curved surface projecting multiple 2-D images, ACM SIGGRAPH Asia 2016 Posters, Macao, China (2016).
4. **R. Hirayama**, A. Shiraki, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito, Refraction-compensating algorithm for a 3D glass structure exhibiting multiple 2D images, Frontiers in Optics / Laser Science 2016, Rochester, USA (2016).
5. M. Oikawa, D. Hiyama, **R. Hirayama**, S. Hasegawa, Y. Endo, T. Sugie, N. Tsumura, M. Kuroshima, M. Maki, G. Okada, C. Lei, Y. Ozeki, K. Goda, T. Shimobaba, A computational approach to real-time image processing for serial time-encoded amplified microscopy, SPIE Photonics West BIOS 2016, San Francisco USA (2016).
6. (invited) A. Shiraki, H. Nakayama, **R. Hirayama**, T. Kakue, T. Shimobaba, T. Ito, Volumetric Display Containing Multiple Two Dimensional Information Patterns, IDW 2015, Otsu, Japan (2015).
7. (invited) **R. Hirayama**, A. Shiraki, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito, 3-D Crystal Exhibiting Multiple 2-D Images with Directivity, VRCAI 2015, Kobe, Japan (2015).
8. **R. Hirayama**, A. Shiraki, H. Nakayama, T. Kakue, T. Shimobaba, T. Ito, 3-D Crystal Exhibiting Multiple 2-D Images with Directivity, ACM SIGGRAPH Asia 2015 Posters, Kobe, Japan (2015).
9. **R. Hirayama**, A. Shiraki, M. Naruse, H. Nakayama, N. Tate, T. Kakue, T. Shimobaba, T. Ito, Optically Controlled Quantum-Dot-Based Volumetric Display Exhibiting Multiple Patterns, JSAP-OSA Joint Symposia 2015, Nagoya, Japan (2015).
10. (invited) **R. Hirayama**, M. Naruse, H. Nakayama, A. Shiraki, T. Kakue, T. Shimobaba, T. Ito, Optically Controlled Volumetric Display Exhibiting Multiple Two-Dimensional Patterns, CC3DMR 2015, Busan, South Korea (2015).
11. **R. Hirayama**, H. Nakayama, A. Shiraki, T. Kakue, T. Shimobaba, T. Ito, Development of Volumetric Display Based on Multi-Bit Color LED, APCCAS 2014, Okinawa, Japan (2014).
12. **R. Hirayama**, H. Nakayama, A. Shiraki, T. Kakue, T. Shimobaba, T. Ito, Volumetric Display Containing Multiple Two-Dimensional Color Motion Pictures, SPIE DSS 2014, Baltimore, USA (2014).
13. (invited) T. Kakue, N. Masuda, Y. Endo, **R. Hirayama**, N. Okada, T. Shimobaba, T. Ito, Special-purpose computer for real-time reconstruction of holographic motion picture, OIT 2013, Beijing, China (2013).
14. **R. Hirayama**, R. Omura, Y. Kobayashi, A. Shiraki, H. Nakayama, T. Kakue, N. Masuda, T. Shimobaba, T. Ito, Development of a digitized volumetric display containing multiple two-dimensional patterns, 3DSA 2013, Osaka, Japan (2013).
15. **R. Hirayama**, H. Ando, A. Shiraki, H. Nakayama, T. Kakue, N. Masuda, T. Shimobaba, T. Ito, Image-quality improvement of multiple two-dimensional patterns contained in three-dimensional volume, 3DSA 2013, Osaka, Japan (2013).
16. **R. Hirayama**, T. Shimobaba, H. Nakayama, A. Shiraki, T. Kakue, N. Masuda, T. Ito, Optical encryption using three-dimensional volume containing multiple two-dimensional information patterns, DHIP 2012, Tokushima, Japan (2012).

**Media**

1. **R. Hirayama**, A. Shiraki, T. Kakue, T. Shimobaba, T. Ito, Optical addressing method for full-color 3D display, SPIE Newsroom (2016).

**Membership**

**Association for Computing Machinery (ACM) 10/2016 – present**

**The Optical Society (OSA) 08/2016 – present**

**The Japan Society of Applied Physics (JSAP) 01/2014 – present**

**Skills**

**Programming Languages**

C, C++, MATLAB, VHDL, Verilog, HTML/CSS

**Others**

Illustrator, LaTeX, MAYA, Unity, Excel, Word, PowerPoint