

CURRICULUM VITAE

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Changyo Han

Ph. D. student

Department of Information and Communication Engineering,
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EDUCATION

The University of Tokyo, Japan (Apr. 2017 – present)

Ph. D. student in Information and Communication Engineering course

Advisor: Takeshi Naemura

The University of Tokyo, Japan (Apr. 2011 – Mar. 2013)

Master of Engineering in Electrical Engineering and Information Systems

Advisor: Kazuro Kikuchi

Tokyo Institute of Technology, Japan (Apr. 2007 – Mar. 2011)

Bachelor of Engineering in Electrical and Electronic Engineering

Advisor: Kenichi Okada

RESEARCH INTERESTS

- Digital fabrication, 3D printing
- Digital signal processing in optical fiber communications systems
- Nonlinear channel modelling and compensation

WORK EXPERIENCE

ETRI, Korea (Apr. 2013 – Sep. 2016)

Research Engineer in Optical Internet Research Department

TEACHING EXPERIENCE

Oct. 2011 – Nov. 2011

Teaching Assistant, optical communication systems, The University of Tokyo.

FELLOWSHIPS

2019 -	JSPS Research Fellowship for Young Scientists (DC2)
2017 - present	Graduate Program for Social ICT Global Creative Leaders
2007 - 2011	Japan-Korea Joint Program for Science and Engineering (Government scholarship)
2012 - 2013	Seihou scholarship

PUBLICATIONS

[Journal papers]

1. **C. Han**, T. Naemura, "BumpMarker: a 3D-printed tangible marker for simultaneous tagging, tracking, and weight measurement," *ITE Transactions on Media Technology and Applications*, to appear, Jan. 2019.
2. **C. Han**, S.-H. Cho, M. Sung, H. S. Chung, S. M. Kim, and J. H. Lee, "Performance Improvement of Multi-IFoF-based Mobile Fronthaul Using Dispersion-Induced Distortion Mitigation with IF Optimization," *Journal of Lightwave Technology*, accepted.
3. **C. Han**, S.-H. Cho, M. Sung, H. S. Chung, and J. H. Lee, "Clipping Distortion Suppression of Multi-IF-over-Fiber Mobile Fronthaul Links Using Shunt Diode Predistorter," *ETRI Journal*, vol. 38, no. 2, pp. 227-234, 2016.
4. S.-H. Cho, **C. Han**, H. S. Chung, and J. H. Lee. "Demonstration of Mobile Fronthaul Test Bed Based on RoF Technology Supporting Two Frequency Assignments and 2x2 MIMO Antennas." *ETRI Journal* 37, no. 6 (2015): 1055-1064.
5. M. Sung, **C. Han**, S.-H. Cho, H. S. Chung, and J. H. Lee. "Improvement of the transmission performance in multi-IF-over-fiber mobile fronthaul by using tone-reservation technique." *Optics express* 23, no. 23 (2015): 29615-29624.
6. S. H. Chang, H. S. Chung, R. Ryf, N. K. Fontaine, **C. Han**, K. J. Park, K. Kim, J. C. Lee, J. H. Lee, B. Y. Kim, and Y. K. Kim. "Mode-and wavelength-division multiplexed transmission using all-fiber mode multiplexer based on mode selective couplers." *Optics express* 23, no. 6 (2015): 7164-7172.

[International conference papers]

1. **C. Han**, T. Naemura, "BumpMarker: 3D printed marker for simultaneous tagging and weight measurement," In *Proc. ACM SCF 2018*, Cambridge, MA, USA, Jun. 2018.
2. **C. Han**, M. Sung, S.-H. Cho, H. S. Chung, S. M. Kim, and J. H. Lee, "Impact of Dispersion-Induced Second-Order Distortion in Multi-IFoF-based Mobile Fronthaul Link for C-RAN," in *Proc. OFC 2016*, TU2B.4., 2016
3. **C. Han**, S.-H. Cho, H. S. Chung, and J. H. Lee. "Linearity improvement of directly-modulated multi-IF-over-fibre LTE-A mobile fronthaul link using shunt diode predistorter." In *Optical Communication (ECOC)*, 2015 European Conference on, pp. 1-3. IEEE, 2015.
4. S.-H. Cho, H. S. Chung, **C. Han**, S. Lee, and J. H. Lee. "Experimental demonstrations of next generation cost-effective mobile fronthaul with IFoF technique." In *Optical Fiber Communication*

Conference, pp. M2J-5. Optical Society of America, 2015.

5. **C. Han**, S.-H. Cho, H. S. Chung, S. Lee, and J. H. Lee. "Experimental comparison of the multi-IF carrier generation methods in IF-over-Fiber system using LTE signals." In Microwave Photonics (MWP) and the 2014 9th Asia-Pacific Microwave Photonics Conference (APMP) 2014 International Topical Meeting on. 2014.
6. H. S. Chung, S.-H. Cho, **C. Han**, S. Lee, J. C. Lee, and J. H. Lee. "Design of RoF based mobile fronthaul link with multi-IF carrier for LTE/LTE-A signal transmission." In Microwave Photonics (MWP) and the 2014 9th Asia-Pacific Microwave Photonics Conference (APMP), 2014 International Topical Meeting on, pp. 303-306. IEEE, 2014.
7. S.-H. Cho, H. S. Chung, **C. Han**, S. Lee, and J. H. Lee. "Investigations of EVM performance degradations caused by nonlinearity in mobile fronthaul architecture based on IFoF technology." In 2014 12th International Conference on Optical Internet 2014 (COIN). 2014.
8. **C. Han**, H. S. Chung, S. H. Chang, K. Kim, and J. H. Lee. "Effect of rotational misalignment in phase-plate based mode multiplexer." In Optical Internet 2014 (COIN), 2014 12th International Conference on, pp. 1-2. IEEE, 2014.
9. H. Lu, Y. Mori, **C. Han**, and K. Kikuchi, "Novel polarization-diversity scheme based on mutual phase conjugation for fiber-nonlinearity mitigation in ultra-long coherent optical transmission systems," European Conference on Optical Communication (ECOC2013), We.3.C.3, London,UK (22-26 Sept. 2013)
10. Y. Mori, **C. Han**, H. Lu, and K. Kikuchi, "Wavelength demultiplexing of Nyquist WDM signals under large frequency offsets in digital coherent receivers," European Conference on Optical Communication (ECOC2013), Mo.4.C.6, London,UK (22-26 Sept. 2013)
11. **C. Han**, K. Igarashi, and K. Kikuchi, "Influence of channel misalignment of time-interleaved DAC on sensitivity degradation in coherent optical receivers," Optical Fiber Communications Conference (OFC 2013), Anaheim, CA, USA, OTh1F.2 (17-21 March 2013)
12. Yuki Tsukui, Hiroki Asada, **Changyo Han**, Kenichi Okada, and Akira Matsuzawa, "Area Reduction of Millimeter-Wave CMOS Amplifier Using Narrow Transmission Line," IEEE Asia-Pacific Microwave Conference (APMC), Melbourne, Australia, Dec. 2011.
13. Ryo Minami, **Changyo Han**, Kota Matsushita, Kenichi Okada, and Akira Matsuzawa, "Effect of Transmission Line Modeling Using Different De-embedding Methods," IEEE MTT-S European Microwave Conference (EuMC), Manchester, UK, Oct. 2011.

PATENTS

1. U. S. Patent 9,787,395 B2: "Control Apparatus and Method for Monitoring Optical Fiber Link," Oct. 10, 2017.
2. U. S. Patent 9,787,401 B2: "Mode Division Multiplexed Passive Optical Network (MDM-PON) Apparatus, and Transmission and Reception Method Using the Same," Oct. 10, 2017.
3. U. S. Patent 9,998,222 B2: "Optical Signal Transmission System and Method of Allocating Center Frequencies of Intermediate Frequency (IF) Carriers for Frequency Division Multiplexing (FDM) Optical Fiber Link," Jun. 12, 2018.
4. U. S. Patent 10,027,415 B2: "Apparatuses and Methods for Transmitting and Receiving Control Signal in Analog Radio-over-Fiber (RoF)-based Mobile Fronthaul," Jul. 17, 2018.

5. U. S. Patent 10,090,928 B2: "Analog Optical Transmission System Using Dispersion Management Technique," Oct. 2, 2018.

EXPERIENCES

Journal Reviewer: IEEE JOCN, IEEE/OSA Optics Express

SKILLS

- Design and prototyping skills using **3D printers, Arduino**
- Digital signal processing using **MATLAB, Python, C++, Java, Processing**
- RF simulation and design experience in **ADS, AWR, HFSS**
- 3D CAD skills using **Fusion 360, Sketchup, Blender**
- Literacy and conversation skills in both Japanese and English (JLPT: 180 (perfect score), TOEIC: 970)