Yuyang Wang

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Appointment

University of Connecticut — Storrs, CT, USA
Assistant Professor, Department of Electrical and Computer Engineering — 2025–Present

Columbia University in the City of New York — New York, NY, USA
Postdoctoral Research Scientist, Columbia Nano Initiative — 2021–2025

Education

University of California, Santa Barbara — Santa Barbara, CA, USA
Ph.D. in Electrical and Computer Engineering — 2018–2021

University of California, Santa Barbara — Santa Barbara, CA, USA
M.S. in Electrical and Computer Engineering — 2015–2018

Tsinghua University — Beijing, China
B.Eng. in Electronic Engineering — 2011–2015

Experience

Semiconductor Research Corporation (SRC) Research Scholars Program
Research Scholar, Center for Ubiquitous Connectivity (CUbiC) under SRC JUMP 2.0 — 2023–2025

Hong Kong University of Science and Technology — Hong Kong SAR, China
Postgraduate Visiting Intern, Department of Electrical and Computer Engineering — Aug. 2019–Dec. 2019

Cadence Design Systems, Inc. — San Jose, CA, USA
Design Engineering Intern - Photonics, Custom IC & PCB Group — Jun. 2018–Sep. 2018

Rice University — Houston, TX, USA
Student Intern, Department of Electrical and Computer Engineering — Jul. 2014–Sep. 2014

Publication

Journal Articles

J1 R. Parsons, K. Jang, **Y. Wang**, A. Novick, A. M. Smith, C. C. Tison, Y. Gebregiorgis, V. Deenadayalan, M. van Niekerk, L. Carpenter, T. Ngai, G. Leake, D. Coleman, X. Meng, S. Preble, M. L. Fanto, K. Bergman, and A. Rizzo, "Highly uniform thermally undercut silicon photonic devices in a 300 mm CMOS foundry process," *Scientific Reports*, vol. 15, no. 1, p. 29 906, Aug. 2025. 10.1038/s41598-025-14480-4

J2 J. Robinson, R. Parsons, **Y. Wang**, K. Jang, X. Meng, and K. Bergman, "Silicon Photonic DWDM Micro-Resonator Link Initialization Under Fabrication Variation," *Optics Express*, Aug. 2025, in press. 10.1364/opticaopen.29963318.v2

J3 S. Wang, **Y. Wang**, S. Sanyal, R. Parsons, X. Ji, Y. Okawachi, X. Meng, M. Lipson, A. Gaeta, and K. Bergman, "Automated tuning of a ring-assisted MZI-based interleaver for Kerr frequency combs," *Optics Letters*, vol. 50, no. 2, p. 698, Jan. 2025. 10.1364/OL.546772

J4 **Y. Wang**, S. Wang, R. Parsons, S. Sanyal, V. Gopal, A. Novick, A. Rizzo, M. Lipson, A. L. Gaeta, and K. Bergman, "Co-Designed Silicon Photonics Chip I/O for Energy-Efficient Petascale Connectivity," *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 15, no. 8, pp. 1581–1591, Aug. 2025. 10.1109/TCPMT.2024.3492189 invited

J5 Z. Wu, L. Yuan Dai, **Y. Wang**, S. Wang, and K. Bergman, "Flexible silicon photonic architecture for accelerating distributed deep learning," *Journal of Optical Communications and Networking*, vol. 16, no. 2, A157, Feb. 1, 2024. 10.1364/JOCN.497372 invited

J6 A. James, A. Rizzo, **Y. Wang**, A. Novick, S. Wang, R. Parsons, K. Jang, M. Hattink, and K. Bergman, "Process Variation-Aware Compact Model of Strip Waveguides for Photonic Circuit Simulation," *Journal of Lightwave Technology*, pp. 1–14, 2023. 10.1109/JLT.2023.3238847

J7 A. Novick, A. James, L. Y. Dai, Z. Wu, A. Rizzo, S. Wang, **Y. Wang**, M. Hattink, V. Gopal, K. Jang, R. Parsons, and K. Bergman, "High-bandwidth density silicon photonic resonators for energy-efficient optical interconnects," *Applied Physics Reviews*, vol. 10, no. 4, p. 041 306, Nov. 2023. 10.1063/5.0160441 invited

J8 **Y. Wang**, P. Sun, J. Hulme, M. A. Seyedi, M. Fiorentino, R. G. Beausoleil, and K.-T. Cheng, "Energy Efficiency and Yield Optimization for Optical Interconnects via Transceiver Grouping," *Journal of Lightwave Technology*, vol. 39, no. 6, pp. 1567–1578, Mar. 2021. 10.1109/JLT.2020.3039489

J9 Z. Zhang, R. Wu, **Y. Wang**, C. Zhang, E. J. Stanton, C. L. Schow, K.-T. Cheng, and J. E. Bowers, "Compact Modeling for Silicon Photonic Heterogeneously Integrated Circuits," *Journal of Lightwave Technology*, vol. 35, no. 14, pp. 2973–2980, Jul. 2017. 10.1109/JLT.2017.2706721

Conference Proceedings

C1 N. Nauman, J. Robinson, **Y. Wang**, K. Jang, X. Meng, and K. Bergman, "Photonic Analog-to-Digital Architecture for Accelerating Multiply-Accumulate Operations," in *Optical Fiber Communication Conference (OFC) 2025 (2025), Paper W3D.5*, Optica Publishing Group, Mar. 2025, W3D.5. 10.1364/OFC.2025.W3D.5

C2 R. Parsons, S. Sanyal, M. Cullen, **Y. Wang**, A. Novick, X. Ji, Y. Okawachi, X. Meng, M. Lipson, A. Gaeta, and K. Bergman, "Dispersion-Engineered Resonator-Based Interleaver Co-Designed with Kerr Comb Source," in *Optical Fiber Communication Conference (OFC) 2025 (2025), Paper Tu2G.6*, Optica Publishing Group, Mar. 2025, Tu2G.6. 10.1364/OFC.2025.Tu2G.6

C3 A. Rovinski, Y. Ou, C. Ou, D. Khilwani, **Y. Wang**, S. Wang, S. Lee, K. Bergman, A. Molnar, and C. Batten, "Scaling Co-Packaged Optical Interconnects Using Hybrid 2.5D/3D Integration," in *2025 IEEE International Symposium on Circuits and Systems (ISCAS)*, May 2025, pp. 1–5. 10.1109/ISCAS56072.2025.11043946

C4 **Y. Wang**, S. Wang, S. Sanyal, N. Nauman, R. Parsons, J. Robinson, M. Hattink, K. Jang, A. Novick, K. J. McNulty, X. Meng, M. Lipson, A. L. Gaeta, and K. Bergman, "Order-Preserving Channel Calibration of Kerr Comb–Driven Microresonator-Based DWDM Link," in *Optical Fiber Communication Conference (OFC) 2025 (2025), Paper W1E.1*, Optica Publishing Group, Mar. 2025, W1E.1. 10.1364/OFC.2025.W1E.1

C5 A. Novick, M. Hattink, A. Rizzo, **Y. Wang**, V. Gopal, S. Wang, R. Parsons, and K. Bergman, "Integrated Photonic Resonant Modulator-Based Equalization and Optimization for DWDM," in *Optical Fiber Communication Conference (OFC) 2024*, San Diego California: Optica Publishing Group, 2024, W1K.5. 10.1364/OFC.2024.W1K.5

C6 S. Wang, **Y. Wang**, X. Meng, K. Hosseini, T. T. Hoang, and K. Bergman, "Automated Tuning of Ring-Assisted MZI-Based Interleaver for DWDM Systems," in *Optical Fiber Communication Conference (OFC) 2024*, San Diego California: Optica Publishing Group, 2024, Th1A.3. 10.1364/OFC.2024.Th1A.3

C7 **Y. Wang**, S. Wang, R. Parsons, A. Novick, V. Gopal, K. Jang, A. Rizzo, C.-P. Chiu, K. Hosseini, T. T. Hoang, S. Shumarayev, and K. Bergman, "Silicon Photonics Chip I/O for Ultra High-Bandwidth and Energy-Efficient Die-to-Die Connectivity," in *2024 IEEE Custom Integrated Circuits Conference (CICC)*, Denver, CO, USA: IEEE, Apr. 21, 2024, pp. 1–8. 10.1109/CICC60959.2024.10529018 invited

C8 Z. Wu, R. Parsons, S. Wang, **Y. Wang**, and K. Bergman, "Wavelength Reconfigurable Transceiver For Multi-Interface Compute Accelerator Networks," in *Optical Fiber Communication Conference (OFC) 2024*, San Diego California: Optica Publishing Group, 2024, W4F.2. 10.1364/OFC.2024.W4F.2

C9 G. Michelogiannakis, Y. Arafa, B. Cook, L. Y. Dai, A.-H. Hameed Badawy, M. Glick, **Y. Wang**, K. Bergman, and J. Shalf, "Efficient Intra-Rack Resource Disaggregation for HPC Using Co-Packaged DWDM Photonics," in *2023 IEEE International Conference on Cluster Computing (CLUSTER)*, Santa Fe, NM, USA: IEEE, Oct. 2023, pp. 158–172. 10.1109/CLUSTER52292.2023.00021

C10 S. Wang, A. Novick, A. Rizzo, R. Parsons, S. Sanyal, K. J. McNulty, B. Y. Kim, Y. Okawachi, **Y. Wang**, A. Gaeta, M. Lipson, A. Gaeta, M. Lipson, and K. Bergman, "Integrated, Compact, and Tunable Band-Interleaving of a Kerr Comb Source," in *CLEO 2023*, San Jose, CA: Optica Publishing Group, 2023, STh3J.6. 10.1364/CLEO_SI.2023.STh3J.6

C11 **Y. Wang**, A. Novick, R. Parsons, S. Wang, K. Jang, A. James, M. Hattink, V. Gopal, A. Rizzo, C.-P. Chiu, K. Hosseini, T. T. Hoang, and K. Bergman, "Scalable architecture for sub-pJ/b multi-Tbps comb-driven DWDM silicon photonic transceiver," in *Next-Generation Optical Communication: Components, Sub-Systems, and Systems XII*, G. Li, K. Nakajima, and A. K. Srivastava, Eds., San Francisco, United States: SPIE, Mar. 2023, p. 55. 10.1117/12.2649506 invited

C12 **Y. Wang**, S. Wang, A. Novick, A. James, R. Parsons, A. Rizzo, and K. Bergman, "Dispersion-Engineered and Fabrication-Robust SOI Waveguides for Ultra-Broadband DWDM," in *Optical Fiber Communication Conference (OFC) 2023*, San Diego California: Optica Publishing Group, 2023, Th3A.4. 10.1364/OFC.2023.Th3A.4

C13 A. James, **Y. Wang**, A. Rizzo, and K. Bergman, "Flexible, Process-Aware Compact Model of Effective Index in Silicon Waveguides for Commercial Foundries," in *2022 International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)*, Turin, Italy: IEEE, Sep. 2022, pp. 173–174. 10.1109/NUSOD54938.2022.9894784

C14 **Y. Wang** and K.-T. Cheng, "Traffic-Adaptive Power Reconfiguration for Energy-Efficient and Energy-Proportional Optical Interconnects," in *2021 IEEE/ACM International Conference On Computer Aided Design (ICCAD)*, Munich, Germany: IEEE, Nov. 2021, pp. 1–9. 10.1109/ICCAD51958.2021.9643475

C15 **Y. Wang**, J. Hulme, P. Sun, M. Jain, M. A. Seyedi, M. Fiorentino, R. G. Beausoleil, and K.-T. Cheng, "Characterization and Applications of Spatial Variation Models for Silicon Microring-Based Optical Transceivers," in *2020 57th ACM/IEEE Design Automation Conference (DAC)*, San Francisco, CA, USA: IEEE, Jul. 2020, pp. 1–6. 10.1109/DAC18072.2020.9218608

C16 **Y. Wang** and K.-T. Cheng, "Task Mapping-Assisted Laser Power Scaling for Optical Network-on-Chips," in *2019 IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, Westminster, CO, USA: IEEE, Nov. 2019, pp. 1–6. 10.1109/ICCAD45719.2019.8942146

C17 **Y. Wang**, M. A. Seyedi, J. Hulme, M. Fiorentino, R. G. Beausoleil, and K.-T. Cheng, "Bidirectional tuning of microring-based silicon photonic transceivers for optimal energy efficiency," in *Proceedings of the 24th Asia and South Pacific Design Automation Conference*, Tokyo Japan: ACM, Jan. 2019, pp. 370–375. 10.1145/3287624.3287649

C18 **Y. Wang**, L. Shao, M. A. Lastras-Montano, and K.-T. Cheng, "Taming Emerging Devices' Variation and Reliability Challenges with Architectural and System Solutions [Invited]," in *2019 IEEE 32nd International Conference on Microelectronic Test Structures (ICMTS)*, Kita-Kyushu City, Fukuoka, Japan: IEEE, Mar. 2019, pp. 90–95. 10.1109/ICMTS.2019.8730924 invited

C19 **Y. Wang**, M. A. Seyedi, R. Wu, J. Hulme, M. Fiorentino, R. G. Beausoleil, and K.-T. Cheng, "Energy-efficient channel alignment of DWDM silicon photonic transceivers," in *2018 Design, Automation & Test in Europe Conference & Exhibition (DATE)*, Dresden, Germany: IEEE, Mar. 2018, pp. 601–604. 10.23919/DATE.2018.8342079

C20 R. Wu, M. A. Seyedi, **Y. Wang**, J. Hulme, M. Fiorentino, R. G. Beausoleil, and K.-T. Cheng, "Pairing of microring-based silicon photonic transceivers for tuning power optimization," in *2018 23rd Asia and South Pacific Design Automation Conference (ASP-DAC)*, Jeju: IEEE, Jan. 2018, pp. 135–140. 10.1109/ASPDAC.2018.8297295

C21 R. Wu, **Y. Wang**, Z. Zhang, C. Zhang, C. L. Schow, J. E. Bowers, and K.-T. Cheng, "Compact modeling and circuit-level simulation of silicon nanophotonic interconnects," in *Design, Automation & Test in Europe Conference & Exhibition (DATE), 2017*, Lausanne, Switzerland: IEEE, Mar. 2017, pp. 602–605. 10.23919/DATE.2017.7927057

C22 A. Ghofrani, M. A. Lastras-Montaño, **Y. Wang**, and K.-T. Cheng, "In-place Repair for Resistive Memories Utilizing Complementary Resistive Switches," in *Proceedings of the 2016 International Symposium on Low Power Electronics and Design*, San Francisco Airport CA USA: ACM, Aug. 2016, pp. 350–355. 10.1145/2934583.2934590

C23 C. Xu, F. X. Lin, **Y. Wang**, and L. Zhong, "Automated OS-level Device Runtime Power Management," in *Proceedings of the Twentieth International Conference on Architectural Support for Programming Languages and Operating Systems*, Istanbul Turkey: ACM, Mar. 2015, pp. 239–252. 10.1145/2694344.2694360

Under Review and In Preparation

P1 V. Gopal, A. Novick, M. Hattink, S. Sanyal, S. Wang, M. Cullen, A. Rizzo, A. E. James, **Y. Wang**, X. Meng, M. Lipson, A. L. Gaeta, and K. Bergman, "Resonant modulator-based equalization for frequency comb-driven dense wavelength division multiplexing interconnects," *Journal of Lightwave Technology*, under review.

P2 S. Wang, R. Parsons, A. Novick, V. Gopal, M. Cullen, A. Rizzo, **Y. Wang**, X. Meng, and K. Bergman, "Compact and efficient 32Gbps PAM4 segmented vertical junction silicon microdisk modulator," in preparation.

P3 **Y. Wang**, S. Wang, P. Dilip, R. Parsons, K. Jang, M. Haimowitz, V. Gopal, A. Novick, A. Rizzo, and K. Bergman, "128-channel DWDM silicon photonic transmitter for >10 Tbps/mm optical I/O," in preparation.

P4 T. Zypman, R. Parsons, **Y. Wang**, K. Jang, S. Wang, X. Meng, and K. Bergman, "Silicon photonic MIMO DSP for mode-division multiplexing and multi-dimensional data transmission," *Optics Express*, under review.

P5 R. Parsons, A. Oh, J. Robinson, S. Wang, M. Cullen, K. Jang, A. James, **Y. Wang**, and K. Bergman, "Foundry-enabled wafer-scale silicon photonic DWDM links," *Nanophotonics*, 2025, under review.

Presentation

Seminar Dept of ECE, University of Connecticut — Storrs, CT, USA
Photonics-Empowered Computing: From Efficient to Functional Data Movement — Feb. 2025

Seminar School of ECEE, Arizona State University — Tempe, AZ, USA
Photonics-Empowered Computing: From Efficient to Functional Data Movement — Feb. 2025

Seminar Dept of ECE, University of Minnesota — Minneapolis, MN, USA
Photonics-Empowered Computing: From Efficient to Functional Data Movement — Feb. 2025

Presentation SRC TECHCON — Austin, TX, USA
Scalable Kerr-Comb Driven DWDM Silicon Photonics Chip I/O — Sep. 2024

Seminar School of EECS, Pennsylvania State University — University Park, PA, USA
Co-Designing Photonics for Heterogeneously Integrated Systems — Apr. 2024

Invited Talk SPIE Photonics West — San Francisco, CA, USA
Scalable Architecture for Sub-pJ/b Multi-Tbps Comb-Driven DWDM Silicon Photonic Transceiver — Jan. 2023

Poster Ph.D. Forum, ACM/IEEE Design Automation Conference (DAC) — Online Virtual Event
Design and Optimization of Variation-Aware Runtime-Reconfigurable Optical Interconnects — Jun. 2020

Invited Talk Optical/Photonic Interconnects for Computing Systems (OPTICS) Workshop — Dresden, Germany
Optimal Pairing and Non-Uniform Channel Alignment of Microring-Based Transceivers for Comb Laser–Driven DWDM Silicon Photonics — Mar. 2018

Seminar Department of ECE, Hong Kong University of Science and Technology — Hong Kong SAR, China
Variation-Aware Modeling and Design of Silicon Photonic Systems — Jan. 2018

Poster Optical/Photonic Interconnects for Computing Systems (OPTICS) Workshop — Lausanne, Switzerland
Variation-Aware Modeling and Design of Nanophotonic Interconnects — Mar. 2017

Mentoring

U : undergraduate; G : graduate

Songli Wang G
Ph.D. Student at Columbia University
Scalable link architectures, automated post-fabrication tuning
Resulting joint publication(s): [P2], [P3], [J3], [J4], [C4], [C6], [C7], [C11], [C12]

Aneek E. James G
Ph.D. Student at Columbia University, now with Draper Laboratory
Wafer-scale process variation extraction and characterization
Resulting joint publication(s): [J6], [C12], [C13]

Kaylx Jang G
Ph.D. Student at Columbia University
DWDM dispersion engineering, optically connected memory
Resulting joint publication(s): [P3], [C12]

Tobias Zypman G
Ph.D. Student at Columbia University
Photonics-Enabled Signal Processing
Resulting joint publication(s): [P4]

James Robinson G
Ph.D. Student at Columbia University
Variation-aware tuning of microresonator-based DWDM links
Resulting joint publication(s): [J2], [C4]

Abidur Rahman U
Undergraduate Student at University of Michigan, Ann Arbor
SURE Program of Columbia Engineering for under-represented students
Design space exploration of optically connected compute systems

Robert Parsons G
Ph.D. Student at Columbia University
Variation-aware modeling and uncertainty quantification
Resulting joint publication(s): [P3], [J1], [C2], [J4], [C7], [C11], [C12]

Zhenguo Wu G
Ph.D. Student at Columbia University
Reconfigurable architecture for optically connected systems
Resulting joint publication(s): [C8], [J5]

Nathaniel Nauman G
Ph.D. Student at Columbia University
Photonics-Enabled Compute for AI
Resulting joint publication(s): [C1]

Priyanka Dilip G
Ph.D. Student at Columbia University
Photonics design for testing and design for packaging
Resulting joint publication(s): [P3]

Max Haimowitz G
Ph.D. Student at Columbia University
Scripted and automated large-scale silicon photonics chip layout
> 80 mm²/reticle fully-scripted layout on a 300 mm full-wafer run

Teaching

U : undergraduate; G : graduate

Columbia University in the City of New York — New York, NY, USA

- Guest Lecturer — ELEN 9404: Seminar in Lightwave Communications G — Spring 2024
- Guest Lecturer — ELEN 9403: Seminar in Photonics G — Spring 2023

University of California, Santa Barbara — Santa Barbara, CA, USA

- Teaching Assistant — ECE 153B: Sensor & Peripheral Interface Design U — Winter 2019

Leadership

Center for Ubiquitous Connectivity (CUbiC) SRC JUMP 2.0

- Subgroup Leader, *Systems and Testbeds,* coordinating four research tasks across three teams 2024–2025
- CUbiC Scholar Leadership Council, leading monthly workshops with industry liaisons 2023–2025
- Task Co-Lead, *Socket-to-Socket Distributed AI/ML/HPC Fabric Platform (SoSFab),* photonics system testbed development 2023–2025

Columbia University in the City of New York New York, NY, USA

- Photonics Lead, *DARPA PIPES,* in collaboration with Intel, Cornell Univ. (Phase 2) and Orora Design Technologies (Phase 3) 2021–2025
- Design and Aggregation Co-Lead, custom 300 mm wafer run with AIM Photonics involving multiple internal/external riders 2023

Service

Technical Program Committee

- *IEEE Chiplet Workshop: Standards, Circuits and Systems* 2025

Journal Reviewer

- *Nature Communications,* Nature Publishing Group
- *Nature Nanotechnology,* Nature Publishing Group
- *Communications Engineering,* Nature Publishing Group
- *APL Photonics,* American Institute of Physics
- *Journal of Lightwave Technology,* IEEE/Optica
- *Journal of Selected Areas in Communications,* IEEE
- *Journal on Emerging and Selected Topics in Circuits and Systems,* IEEE
- *IEEE Transactions on Computers,* IEEE
- *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems,* IEEE
- *IEEE Transactions on Very Large Scale Integration (VLSI) Systems,* IEEE
- *IEEE Access,* IEEE

Conference Reviewer

- *Optical Fiber Communication Conference (OFC)* 2024
- *IEEE International Symposium on High-Performance Computer Architecture (HPCA)* 2020

Textbook Translation

T1 C. Hawkins, J. Segura, and P. Zarkesh-Ha, *CMOS Digital Integrated Circuits: A First Course (Chinese Edition)*, trans. by **Y. Wang** and Y. Yin. China Machine Press, 2016, original work published by the Institution of Engineering and Technology (IET) in 2013.

T2 S. Kundu and A. Sreedhar, *Nanoscale CMOS VLSI Circuits: Design for Manufacturability (Chinese Edition)*, trans. by **Y. Wang** and W. Xie. China Science Publishing, 2014, original work published by McGraw-Hill Education in 2010.

Under-Represented Student Mentor

- Summer Undergraduate Research Experience (SURE) Program, *Columbia Engineering* 2024