

KUN WOO CHO

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Research Interest

My research focuses on developing software-hardware systems that scale up efficiency of 5G networks via integrating new techniques from diverse areas including machine learning and metamaterial.

Education

Princeton University Ph.D. in Computer Science <i>Advisor:</i> Prof. Kyle Jamieson <i>- Selected courses:</i> Advanced Computer Networks, Wireless Networks, Information Theory, Neural Networks, Computer Vision	09/2018-present
University at Buffalo, SUNY B.S. in Computer Engineering (<i>Summa Cum Laude</i>) <i>Advisor:</i> Prof. Wenyao Xu <i>- Selected courses:</i> Intro. to Machine Learning, Computer Security, Microprocessors, Microelectronic Circuits	09/2014-05/2018
University of Cambridge Visiting Scholar <i>Advisor:</i> Prof. Cecilia Mascolo	06/2017-08/2017

Peer Reviewed Publications

- Kun Woo Cho**, Kyle Jamieson, “**Scaling Massive IoT Networks via Cross-Link Channel Prediction**” (in submission)
- Kun Woo Cho**, Mohammad H. Mazaheri, Jeremy Gummesson, Omid Abari, Kyle Jamieson, “**mmWall: A Reconfigurable Metamaterial Surface for mmWave Networks**”, *ACM HotMobile’21* (<https://arxiv.org/abs/2102.00990>)
- Feng Lin, **Kun Woo Cho**, Chen Song, Wenyao Xu, Zhanpeng Jin, “**Exploring a Brain-based Cancelable Biometrics for Smart Headwear: Concept, Implementation, and Evaluation**”, *IEEE TMC’19*
- Feng Lin, **Kun Woo Cho**, Chen Song, Wenyao Xu, Zhanpeng Jin, “**Brain Password: A Secure and Truly Cancelable Brain Biometrics for Smart Headwear**”, *ACM MobiSys’18*
- Kun Woo Cho**, Feng Lin, Chen Song, Xiaowei Xu, Michelle Hartley-McAndrew, Kathy Doody, Wenyao Xu, “**Gaze-Wasserstein: A Quantitative Screening Approach to Autism Spectrum Disorders**”, *IEEE WH’16*
- Kun Woo Cho**, Feng Lin, Chen Song, Xiaowei Xu, Fuxing Gu, Wenyao Xu, “**Thermal Handprint Analysis for Forensic Identification using Heat-Earth Mover’s Distance**”, *IEEE ISBA’16*
- Baicheng Chen, **Kun Woo Cho**, Chenhan Xu, Feng Lin, Zhanpeng Jin, Wenyao Xu, “**A Stimulus-Response based EEG Biometric using Mallows Distance**”, *CCF Transactions on Networking’20*
- Baicheng Chen, **Kun Woo Cho**, Chenhan Xu, Feng Lin, Zhanpeng Jin, Wenyao Xu, “**Exploiting Mallows Distance to Quantify EEG Distribution for Personal Identification**”, *IEEE DSC’19*
- Tri Vu, Hoan Tran, **Kun Woo Cho**, Chen Song, Feng Lin, Michelle Hartley-McAndrew, Kathy Doody, Chang Wen Chen, Wenyao Xu, “**Efficient and Effective Visual Stimuli Design for Quantitative Autism Screening: An Exploratory Study**”, *IEEE BHI’17*

Media Coverages

“ This eye-tracking app could speed-up autism detection. ” <i>Wired UK</i>	2017
“ Student develops smartphone app for early autism detection. ” <i>UPI</i>	2016
“ Smartphone app for early autism detection being developed by UB undergrad. ” <i>UB News</i>	2016

Awards and Honors

Princeton Graduate Student Fellowship	2018
SEAS Dean’s Undergraduate Achievement Award	2018
UB CSE Departmental Award of Research	2018
Grace Hopper Celebration of Women in Computing (GHC) Scholarship	2017
Honors College Scholarship	2017
UB Undergraduate Research and Scholarship Award of Distinction	2017
CURCA Undergraduate Research Award	2016
SUNY STEM Research Passport Award	2015
International Merit Scholarship	2014-2018
Barbara & Jack Davis Dean’s Scholarship	2014-2018
University Honors Program	2014-2018
Dean’s List	2014-2018

Research Experiences

Princeton University, PAWS Laboratory, Princeton, NJ 09/2018-present
Research Assistant, supervised by **Kyle Jamieson**

Metamaterial-based Antenna Design for Long-range Wireless Communications (Ongoing)

- Multi-layer antenna design that consist of metamaterial stacks for low-power and long-range communication.

Programmable Metasurface for mmWave Beam Control in Smart Spaces (Ongoing)

- Simulation and hardware implementation of the lightweight, smart metasurface that relays the mmWave beam in full-angle.
- Introducing new space-division multiple access scheme using the multibeam functionality of the metadvice for the smart environment applications

Deep Generative Model for Wireless Communication in the Large-Scale IoT System (in submission)

- Development of a deep generative model that estimates the wireless channel of the IoT devices based on the nearby, cross-links and thereby reducing the wireless communication overhead in the massive-IoT systems.

University of Cambridge, NetOS Laboratory, UK 06/2017-08/2017
Research intern, supervised by **Cecilia Mascolo**

Mobile Phones based Adaptive Platform to Track User Emotion

- Android app development to track the emotional states of the user via voice analysis.
- Implementation of multiple energy optimization techniques, such as an adaptive duty cycle and local acoustic similarity detection.

NSF REU Program, Buffalo, NY 05/2016-08/2016
Research intern, supervised by **Wenyao Xu**

User Authentication for Smart Headwear through Cancelable Brain Biometrics

- Exploration of a new psychophysiological protocol for secure user authentication of smart headwear via a cancelable event-related potential (ERP) bio-signal and implementation of this protocol in the head-mounted device (HMD) applications.

University at Buffalo, ESC Laboratory, Buffalo, NY 09/2015-05/2018
Research intern, supervised by **Wenyao Xu**

Validation of Sensor-Equipped Insoles for Environment-Free Gait Analysis

- Validation of the Smart Insoles that analyze the walking gait using the Vicon motion capture system.
- Development of the turning detection system for the Smart Insole that enables the home exercise program after the stroke.

Early Screening Approach to Autism Spectrum Disorder Using Discrete Gaze Pattern

- Development of a wireless gaze-based ASD screening system, named Gaze-Wasserstein, that consists a gaze-tracking system and novel dissimilarity measure.
- Stimuli design to elicit atypical gaze behaviors of children with ASD using social scenes.

SUNY STEM Research Program, Buffalo, NY 07/2015-08/2015
Research intern, supervised by **Wenyao Xu**

Thermal Handprint-based Personal Identification Using Heat-Earth Mover's Distance

- Development of a forensic identification system that incorporates thermal handprints and novel distance metrics, Heat-Earth Mover's Distance (HEMD), that is designed specifically for thermal handprint recognition.

Skills

Programming Languages: C, C++, Python, MATLAB, Java, JavaScript, SQL, ARM, MIPS, HTML, CSS, PHP

Circuit Design and Simulations: ANSYS HFSS, ADS, Altium Designer, Multisim, Verilog

Knowledge: Machine Learning Platform (TensorFlow, Torch), Android Programming (Android Studio, NDK), Git

Others: LaTeX, BibTeX, EEGLAB

Teaching Experiences

COS461 Computer Networks	2020
COS IW Mobile Computing Design for Assistive Technology	2019
CSE379 Introduction to Microprocessor	2018
CSE113 Introduction to Computer Programming	2016-2017
CSE101 Computer a General Introduction	2016

Services

Reviewer, ACM Transactions on Computing for Healthcare (HEALTH)	2019
Reviewer, The Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (ACM IMWUT)	2020