

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

Publications

- Kun Woo Cho**, Mohammad H. Mazaheri, Jeremy Gummeson, Omid Abari, Kyle Jamieson, “**mmWall: A Transflective Metamaterial Surface for mmWave Networks**”, under review [[pdf](#)]
- Kun Woo Cho**, Srikar Kasi, Kyle Jamieson, “**A Low-Power OAM Metasurface for Rank-Deficient Wireless Environments**”, under review.
- Kun Woo Cho**, Kyle Jamieson, “**Scaling Massive IoT Networks via Cross-Link Channel Prediction**”, under review.
- Kun Woo Cho**, Yasaman Ghasempour, Kyle Jamieson, “**Towards Dual-band Reconfigurable Metasurface for Satellite Networking**”, ACM HotNets’22 [[pdf](#)]
- Kun Woo Cho**, Mohammad H. Mazaheri, Jeremy Gummeson, Omid Abari, Kyle Jamieson, “**mmWall: A Reconfigurable Metamaterial Surface for mmWave Networks**”, ACM HotMobile’21 [[pdf](#)]
- 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

Media Coverages

- | | |
|---|------|
| “ This eye-tracking app could speed-up autism detection. ” Wired UK | 2017 |
| “ Student develops smartphone app for early autism detection. ” UPI | 2016 |
| “ Smartphone app for early autism detection being developed by UB undergrad. ” UB News | 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
Research Assistant, supervised by **Kyle Jamieson**

09/2018-present

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.

Facebook, Inc., Terragraph Team, Menlo Park, CA
Research intern, managed by **Haleema Mehmood**

05/2021-08/2021

Anomaly Detection and Root Cause Analysis on Terragraph

- Research on mmWave wireless mesh network analysis and optimization using unsupervised machine learning and deep learning techniques.

University of Cambridge, NetOS Laboratory, UK
Research intern, supervised by **Cecilia Mascolo**

06/2017-08/2017

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.

University at Buffalo, ESC Laboratory, Buffalo, NY
Research intern, supervised by **Wenyao Xu**

07/2015-05/2018

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.

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.

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