Neil Klingensmith

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RESEARCH INTERESTS

Embedded Systems, Mobile & IoT Privacy, Virtualization on Resource-Constrained Devices

APPOINTMENTS

Assistant Professor, Loyola University Chicago Computer Science Department **2019-Present**

EDUCATION

PhD, Computer Engineering, University of Wisconsin-Madison **2019**

MS Computer Engineering, University of Wisconsin-Madison **2016**

BS Electrical Engineering, University of Wisconsin-Madison **2010**

PROFESSIONAL EXPERIENCE

Research Assistant, University of Wisconsin Computer Science Department **2012-2019**

FUNDING

Taming Container Privileges using Userland OS Guests,
PI, $500,000, NSA January 2023 - December 2024

Collaborative Research: OAC Core: Advancing Low-Power Computer Vision at the Edge,
Co-PI, $250,000, NSF Award Number 2107020 July 2021 - July 2024

US Department of Energy Fellowship 2013, renewed for 2014
through the Building Innovators Program $110k total

The Brew Seed Accelerator $50k seed investment for Emonix, Fall 2017

MadWorks Accelerator Economic Impact Award, 1st Place, $5k August 2016

AWARDS

UW CS NEST Award, 1st place, $1k, April, 2016

Transcend Madison Innovation Competition, 1st Place, $7.5k March 2016

Dvorak Energy and Global Stewardship Prizes, Fall 2015
Wisconsin Energy and Sustainability Challenge Both 1st place, $10k

Dvorak Energy Prize, Spring 2015
Wisconsin Energy and Sustainability Challenge 3rd place, $500

NSF Travel Grant to attend ACM HotMobile, 2019

NSF Travel Grant to attend ACM eEnergy, 2018

NSF Travel Grant to attend ACM SenSys, 2013, 2015

UNDER SUBMISSION

Trevor: Universally Composable Bit Generation for Zero Involvement Authentication
Isaac Ahlgren, Jack West, Julia Bennett, George K Thiruvathukal, Neil Klingensmith
Under Submission to SenSys 2022

Challenges and Practices of Deep Learning Model Reengineering: A Case Study on Computer Vision
Wenxin Jiang, Vishnu Banna, Naveen Vivek, Abhinav Goel, Nicholas Synovic, Neil Klingensmith, George K Thiruvathukal, James C Davis
Under Submission International Conference on Software Engineering (ICSE 2023)

REFEREED CONFERENCE PUBLICATIONS

[C16] **Are You Really Muted? A Privacy Analysis of Mute Buttons in Video Conferencing Apps**
Yucheng Yang, Jack West, George K Thiruvathukal, Neil Klingensmith, and Kassem Fawaz
Proceedings on Privacy Enhancing Technologies (PoPETS), 2022

[C15] **Establishing trust in vehicle-to-vehicle coordination: a sensor fusion approach**
Jakob Veselsky, Jack West, Isaac Ahlgren, Abhinav Goel, Wenxin Jiang, Kyuin Lee, Younghyun Kim, Yung-Hsiang Lu, James C. Davis, George K. Thiruvathukal, Neil Klingensmith
DI-CPS (Workshop on Data-Driven and Intelligent Cyber-Physical Systems for Smart Cities), Virtual, 2022

[C14] **AeroKey: Using Ambient Electromagnetic Radiation for Secure and Usable Wireless Device Authentication**
Kyuin Lee, Yucheng Yang, Omkar Prabhune, Aishwarya Lekshmi Chithra, Jack West, Kassem Fawaz, Neil Klingensmith, Suman Banerjee, and Younghyun Kim
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 2021

[C13] **Moonshine: An Online Randomness Distiller for Zero-Involvement Authentication**
Jack West, Kyuin Lee, Suman Banerjee, Younghyun Kim, George Thiruvathukal, and Neil Klingensmith,
ACM IPSN, 2021

[C12] **ivPair: Context-Based Fast Intra-Vehicle Device Pairing for Secure Wireless Connectivity**
Kyuin Lee, Neil Klingensmith, Dong He, Suman Banerjee, and Younghyun Kim
ACM WiSec, 2020

[C11] **FLIC: A Distributed Fog Cache for City-Scale Applications**
Jackson West, Neil Klingensmith and George Thiruvathukal
ACM ICFC, 2020

[C10] **VoltKey: Continuous Secret Key Generation based on Power Line Noise for Zero-Involvement Pairing and Authentication**
Kyuin Lee, Neil Klingensmith, Younghyun Kim, Suman Banerjee
Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT), 2019

[C9] **Using Virtualized Task Isolation to Improve Responsiveness in Mobile and IoT Software**
Neil Klingensmith, Suman Banerjee
ACM IoTDI, April 2019

[C8] **A Hypervisor-Based Privacy Agent for Mobile and IoT Systems**
Neil Klingensmith, Younghyun Kim, Suman Banerjee
ACM HotMobile, February 2019

[C7] **A Method for Energy-Efficient Sampling of Analog to Digital Converters**
Neil Klingensmith, Suman Banerjee
ACM Transactions on Sustainable Computing 2019

[C6] **PANDA: Performance Acceleration through Nonuniform Data Acquisition**
Neil Klingensmith, Suman Banerjee
ACM eEnergy, June 2018 (22% Acceptance Ratio)

[C5] **Hermes: A Real Time Hypervisor for Mobile and IoT Systems**
Neil Klingensmith, Suman Banerjee
ACM HotMobile, February 2018

[C4] **SPOCK: A Sensor Value Prediction and Online Control Algorithm for Building Resource Management**
Neil Klingensmith, Anantharaghavan Sridhar, Zachary LaVallee, Suman Banerjee
ACM BuildSys, November 2016 (20% Acceptance Ratio)

[C3] **Water or Slime? A platform for automating water treatment systems**
Neil Klingensmith, Anantharaghavan Sridhar, Zachary LaVallee, Suman Banerjee
ACM BuildSys, November 2015

[C2] **Hot, Cold and In Between: Enabling Fine-Grained Environmental Control in Homes for Efficiency and**

Comfort
Neil Klingensmith, Joseph Bomber, Suman Banerjee
ACM eEnergy, June 2014 (20% Acceptance Ratio)

[C1] **A Distributed Energy Monitoring and Analytics Platform and its Use Cases**
Neil Klingensmith, Dale Willis, Suman Banerjee
ACM BuildSys, November 2013

POSTERS ETC

[P5] **Snapshot Metrics Are Not Enough: Analyzing Software Repositories with Longitudinal Metrics**
Nicolas Synovic, Matt Hyatt, Rohan Sethi, Sohini Thota, Shilpika, Allan J Miller, Wenxin Jiang, Emmanuel S Amobi, Austin Pinderski, Konstantin Laufer, Nicholas J Hayward, Neil Klingensmith, James C Davis, George K Thiruvathukal
ACM Automated Software Engineering (ASE) 2022 Tools Track

[P4] **dBHound - Privacy Sensitive Acoustic Perception in Home Settings (poster)**
Anantharaghavan Sridhar, Neil Klingensmith, Suman Banerjee
ACM SenSys, November 2016

[P3] **Edge Computing in the Extreme for Sustainability (invited paper)**
Suman Banerjee, Neil Klingensmith, Peng Liu, and Anantharaghavan Sridhar
ACM S3, October 2016

[P2] **Water or Slime? A platform for automating water treatment systems (poster)**
Neil Klingensmith, Pete Chulick, Joseph Bomber, Suman Banerjee
ACM BuildSys, November 2014

[P1] **Wireless Control in Microgrids (poster)**
Tyler Duffy, Neil Klingensmith, Giri Venkataramanan
31st WEMPEC Annual Review, May 2012

STUDENTS

Jackson West Master's Thesis
First Employment - University of Wisconsin PhD
Thesis: RANDOMNESS DISTILLATION TO IMPROVE KEY QUALITY FOR CONTEXT-BASED AUTHENTICATION SCHEMES

TEACHING

CS 362 - Introduction to Computer Architecture **Fall 2022**

CS 310 - Introduction to Operating Systems **Fall 2022**

CS 264 - Introduction to Computer Systems **Fall 2022**

CS 264 - Introduction to Computer Systems **Spring 2022**

CS 310 - Introduction to Operating Systems **Spring 2021**

CS 264 - Introduction to Computer Systems **Spring 2021**

CS 362 - Introduction to Computer Architecture **Fall 2020**

CS 264 - Introduction to Computer Systems **Fall 2020**

CS 310 - Introduction to Operating Systems **Spring 2020**

CS 264 - Introduction to Computer Systems **Spring 2020**

CS 163 - Discrete Structures **Fall 2019**

Graduate Teaching Assistant, ECE/CS 491 - Special Topics in Sustainability **Fall 2014**

Graduate Project Advisor, CS 407 - Foundations of Mobile Systems **Fall 2015**

PATENTS

Context-Based Pairing and Methods Thereof, P2005528PP
Kyuin Lee, Neil Klingensmith, Younghyun Kim, Suman Banerjee
(Pending)

Pairing Apparatus using Secret Key Based on Powerline Noise, Method Thereof, P200527PP
Kyuin Lee, Neil Klingensmith, Younghyun Kim, Suman Banerjee
(Pending)

Method and Device for Controlling a Water Conditioning System
Neil Klingensmith, Zach LaVallee, Suman Banerjee
(Pending)

INVITED TALKS

Context-Based Zero-Interaction Authentication, Cambridge University Computer Laboratory Systems Research Group Seminar Series, September 2019

Launching a Startup, UW Industrial Systems Engineering 601, March 2017

Online Water Softener Monitoring, Madison Metropolitan Sewerage District, May 2016

SERVICE

ACM HotMobile PC Member 2023

ACM Transactions on Sustainable Computing (TSUSC) Reviewer 2019, 2020

IEEE Micro Reviewer 2020

ACM ICDCN TPC Member 2020