Jacob **Holtom**

Electrical Engineer

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Work Experience

Center for Wireless Information Systems and Computation Architectures

Arizona State University, Tempe, Arizona

Graduate Research Assitant — *Oct 2019 - PRESENT*

- Develop novel distributed beamforming algorithms and implement real-time over-the-air on software defined radio systems
- Develop WISCANet Software Defined Radio Network with advanced MIMO and phase coherent capabilities
- Develop Adaptive Waveform Toolkit for real-time flexible waveform employment
- Implement 5G technologies in a lab environment and on a custom domain specific heterogenous SoC
- Develop Radar and Communications DSP Algorithm Corpus for DASH-SoC

Artemis Inc

Spanish Fork, Utah

RADAR Engineering Intern — *Apr 2019 - Aug 2019*

- Evaluate and develop autofocus algorithms for Stripmap SAR using Time-Domain Backprojection
- Explore and develop combined radar and communications waveforms
- Develop machine learning models for SIGINT
- Develop direction finding algorithms for cooperative use on Software Defined Radar

BYU Spacecraft Group

Provo, Utah

Lead Communications Engineer — *Apr 2016 - Apr 2019*

- Oversee twin satellites that flew in Sept 2019
- Design an end-to-end satellite communications system within technical constraints
- Lead RF engineering work including the design of dish and on-board antennas and amplifier systems
- Develop custom ground station system that utilizes an Ettus USRP and GNURadio

L-3 Communication Systems West

Salt Lake City, Utah

RF Engineer — *Jan 2018 - Sep 2018*

- Design RF hardware for mission critical systems
- Test and debug RF hardware
- Work in team and follow standard engineering process

BYU Computer Aided Engineering Design and Manufacturing

Provo, Utah

Assistant Systems Administrator — *Nov 2015 - Jan 2018*

- Developed Linux infrastructure to maintain storage, enable authentication and enhance the user experience
- Migrated to a new LDAP cluster and schema using SaltStack
- Implemented MIT Kerberos in the environment using SaltStack

SolvereOne and HouseCall IT

Dulles, Virginia and Washington D.C.

Systems Administrator — *Jun 2013 - Oct 2015*

- Maintained and designed secure network deployments
- Deployed and maintained Windows user and application systems
- Managed Linux administration

Education

Arizona State University

Tempe, Arizona

Ph.D. in Electrical Engineering — *Aug 2019 - PRESENT*

- Dissertation on Novel Distributed Coherent Beamforming Systems
- Achieved Candidacy Oct. 2022

Brigham Young University

Provo, Utah

B.S. in Electrical Engineering — *Sep 2015 - Apr 2019*

- Math Minor

Thomas Jefferson High School for Science and Technology

Alexandria, Virginia

High School Advanced Studies Diploma — *Sep 2011 - Jun 2015*

- Designed custom NFC System for Senior Research Project
- Ranked number one high school in the United States

Projects

Software Defined Radio Network

WISCANet *CURRENT*

- Develop and Maintain advanced Software Defined Radio Network
- Enable rapid over-the-air algorithm development and demonstration

Low SWaP Cubesatellite Radio

Phoenix/Elysium Radio *CURRENT*

- Continuing developing of low size, weight and power cubesatellite radio
- Designing high performance radio supporting spread spectrum communication
- Compatible with many existing protocols and communication implementations

IEEE AP-S Conference 2019 *Atlanta, Georgia*

IEEE AP-S Student Design Contest *Sept 2018 - July 2019*

- Designed low-cost FMCW Radar system for use with Raspberry Pi
- Designed system for use as a class-room demonstration of antenna properties
- Open-sourced design and code for further development and exploration
- Accepted as one of the top 6 finalists in international competition

CCSDS Kernel Driver

Linux Address Family *Jul 2017*

- Designed and implemented Linux kernel address family that adds CCSDS Space Packet Protocol support

Publications and Patents

2022	**WISCANet: A Rapid Development Platform for Beyond 5G and 6G Radio System Prototyping**, MDPI Signals	*Special Issue*
2022	**Respiratory and Heart Rate Detection using Continuous-Wave Radar Testbed Implemented in GNU Radio**, GNU Radio Conference 7	*Washington, DC*
2022	**GNU Radio and CEDR: Runtime Scheduling of Heterogenous Accelerators**, GNU Radio Conference 7	*Washington, DC*
2022	**Multi-stage Distributed Beamforming for Distributed Mosaic Wireless Networks**, 17/688,383	*US Patent Pending*
2021	**Rapid Implementation and Demonstration of Radio Applications Using WISCANet**, IEEE International Symposium on Personal, Indoor and Mobile Radio Communications	*Virtual*
2021	**Cardiac and respiratory sensing from a hovering UAV radar platform**, IEEE Statistical Signal Processing Workshop (SSP)	*Virtual*
2021	**Distributed Beamforming Techniques for Flexible Communications Networks**, 55th Asilomar Conference on Signals, Systems, and Computers	*Asilomar, CA*
2019	**Passive CubeSats for remote inspection of space vehicles**, Journal of Applied Remote Sensing	
2018	**Femtosats: Elegant Flight Telemetry for Model Rockets**, International Telemetry Conference	*Glendale, Arizona*