Jacob **Holtom**

ELECTRICAL ENGINEER

Phoenix, Arizona 85044

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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*

Professional Societies and Service

Antennas and Propogation Society, IEEE

Competencies

- Active Directory, LDAP, Kerberos, Cisco IOS, Sophos UTM, Python, Haskell, C, C++, Embedded Development, Windows Server 2008 -2012 R2, CentOS/Ubuntu/Gentoo/RedHat Linux, BSD, Ansys HFSS, Matlab, Mathematica, VMWare vSphere, VMWare View, Microsoft Office 365, Nagios, Apache, NGINX, MySQL, PostgreSQL, HTML5, JavaScript, CSS, Java, Windows XP - 10, ZFS, SaltStack, LTspice, Autodesk EAGLE, Amateur Radio, FCC Licensing, RF Systems, Modulalation, Packetization and Framing, GNURadio, Ettus USRP, Nuand BladeRF, RF Analysis, Mentor Graphics Xpedition, RF PCB Layout, RF Testing Equipment (Spectrum, Network Analyzers, etc.), National Instruments AWR, Keysight ADS

Extracurricular Activity

Boy Scouts of America

National Capital Area Council

Eagle Scout *Jul. 2011 - Present*

- Designed and manufactured garden signs for the Old Stone House on M. Street in Washington D.C