

Jacob Holtom

ELECTRICAL ENGINEER

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Work Experience

DASH Tech Integrated Circuits

Phoenix, Arizona

CHIEF SYSTEMS ENGINEER

May 2023 - PRESENT

- Lead software embedded software engineering team and implementation for novel heterogenous system on chip
- Develop novel optically-enabled distributed coherent concepts, algorithms and implementations

Center for Wireless Information Systems and Computation Architectures

Arizona State University, Tempe,
Arizona

GRADUATE RESEARCH ASSISTANT

Oct 2019 - Apr 2023

- Develop novel distributed beamforming algorithms and implement real-time over-the-air on software defined radio systems
- Demonstrate performance approaching the theoretical limit for distributed-coherent SNR gain and show first-known distributed-coherent relay interference rejection capability using off the shelf software defined radios
- 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 - Apr 2023

- Dissertation: Distributed Coherent Mesh Beamforming: Algorithms and Implementation

Brigham Young University

B.S. IN ELECTRICAL ENGINEERING

- Math Minor

Provo, Utah

Sep 2015 - Apr 2019

Thomas Jefferson High School for Science and Technology

HIGH SCHOOL ADVANCED STUDIES DIPLOMA

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

Alexandria, Virginia

Sep 2011 - Jun 2015

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

IEEE AP-S STUDENT DESIGN CONTEST

Atlanta, Georgia

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 Propagation 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, Modulation, 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