

## WORK EXPERIENCE

### *Systems Engineer*

*September 2015-Present*

NASA Goddard Space Flight Center Earth Science Mission Operations Code 428  
contracted by Honeywell Technology Solutions Inc

- Recognition and successful mitigation of the failure of spacecraft procedures using Integrated Test and Operations System (ITOS) Spacecraft Test and Operations Language (STOL)
- Improvement of spacecraft DevOps scripts in an agile dev environment to ensure 100% uptime
- Improvement of transition DevOps shell script resulting in more efficient automated transition from Mission Operation Center (MOC) to backup Mission Operation Center for Landsat 8
- Improvement of regression testing DevOps shell script resulting in more efficient automated regression testing of Landsat 8 spacecraft Front End Processor in MOC
- Improvement of load checksums DevOps shell script resulting in more efficient automated checking of the loads to be sent up to Landsat 8 spacecraft
- Acquired Satellite Console Controller and Satellite Operations Controller certifications
- Achieved successful operations, maintenance, and troubleshooting of Landsat 8 without operator errors
- Successful operations of Landsat 8 during rollout of refreshed Mission Operations Center hardware/software
- Successful transition from regular Landsat 8 operations to extended lights out operations relying on automated software more and operators less to save customers money

### *Co-Founder and Chief Technology Officer*

*October 2015-March 2016*

WeCook

- Directed DevOps team that successfully built and maintained using agile development practices a website on Amazon Web Services EC2 (pay for what you use pricing, high availability, performance, deployment speed, and security were AWS pros) to regularly auto bill users, permit editing of chef appointments, and enable Chief Operating Officer to manage hundreds of appointments efficiently
- Created operations software in Python which increased time efficiency over 40x (it used to take about 20 mins to make a single chef appointment document with customer information, my software decreased that time to less than 30 seconds) and increased accuracy 10x (Our chefs used to find mistakes in about one in ten chef appointment sheets they were given, mostly due to errors in figuring out how much of each portion of ingredients to buy, my software decreased the number of errors found to only those errors caused by customers, which I approximated to be about one in a hundred). These numbers were approximated by asking chefs to report to us when they notice a chef appointment sheet error and by asking the COO how long it took to make chef appointment sheets before and after my operations software.
- Wrote and used chef appointment DevOps Python script to automate the creation of chef appointment documents used by the organization which instructed the chefs on the address, names, time of appointment, location, phone number, how much of each ingredient to buy, what cooking tools to bring, and how to cook the food depending on which foods and how much the customer chooses for a specific appointment
- Informed the executive team of technology limitations and expectations to inform business decisions
- Started consumer facing website using JavaScript, Meteor, and Bootstrap with user accounts, Stripe and Facebook integration, and features for presenting meals and nutrition to users as well as scheduling chef appointments (did not need to deploy because of an extremely cheap experienced development team we later tapped)
- Obtained profit margins of 10-30% on bulk food chef appointments
- Attained revenue growth from hundreds monthly in October to \$10k monthly in February

### *Test Engineer*

*April 2014-September 2015*

NASA Goddard Space Flight Center Planetary Environments Laboratory Code 699  
under the supervision of Dr. Paul Mahaffy, contracted by ADNET Systems

- Contributed to Martian satellite MAVEN, and Martian rovers Curiosity and ExoMars
- Tested MicroPirani pressure sensor for ExoMars rover resulting in a well developed and tested solution for taking pressure on Mars

- Successfully calibrated and operated the MAVEN Neutral Gas Ion Mass Spectrometer (NGIMS) testbed and instrument achieving the interpretation of MAVEN data to useful products
- In calibration of MAVEN Testbed we found the pressures that resulted in abundances of each specific element (for example He, Ne, Ar, Kr, Xe, ect.) on our copy of the instrument on Earth and then used that to extrapolate the pressures of these gases on Mars based on the abundances given by the instrument for any particular mass
- Created Python scripts that trends MAVEN NGIMS testbed data and instrument sensitivity using the agile development method resulting in the confirmation that the MAVEN satellite's mass spectrometer and our testbed on the ground is working correctly and not degrading over the life of the mission
- Tested several samples in our replica of Curiosity's mass spectrometer suit on earth to find their fingerprint and try to help match them with results found on Mars
- Improved usability of MAVEN satellite and Curisoity rover front-end web portal that presents and allows manipulation of satellite engineering and science data to the engineers and scientists called XINA online in AngularJS
- Tested several samples in our replica of the Curiosity rover mass spectrometer suit Sample Analysis at Mars (SAM) on earth to find their fingerprint and try to match them with results found on Mars

***Research Assistant***

***Summer 2012 and 2013***

National Institute of Standards and Technology (NIST) in Gaithersburg, MD

under the supervision of Dr. Alan Migdall

- Developed simulations in Python of an efficient single photon source in the lab called the Number Squeezed State Generator (NSSG) by using Spontaneous Parametric Down Conversion (SPDC) with system feedback to achieve super-resolution and supersensitivity
- Built Maximum-Likelihood Estimation (MLE) fitting program in Mathematica and Java to characterize Transition Edge Sensor (TES) data output
- Constructed Modified Levenberg-Marquardt Algorithm (MLMA) fitting program in MATLAB for TES data output
- Programmed Monte Carlo simulations in C++ and Java of Fabry-Perot interferometers with various methods of intensity detection and various quantum states of light input to study sensitivity, visibility, and other characteristics
- Engineered low cost temperature controller to keep non-linear crystals in the range 20 C to 150 C to within 0.05 C
- Used the agile development method in C++ on Arduino to create and tune an easy to operate and troubleshoot temperature proportional-integral-derivative (PID) controller and GUI

***Research Assistant***

***August 2010 - May 2013***

Quantum Science and Technology Group in Baton Rouge, LA

under the supervision of Dr. Jonathan P. Dowling

- Programmed simulations in Mathematica and MATLAB of Mach-Zehnder interferometers with parity detection and various quantum states of light input
- Developed a GUI to run these simulations for a more interactive method to study sensitivity, visibility, and other characteristics
- Published in Physical Review A

**EDUCATION**

***Louisiana State University, Baton Rouge, LA***

***May 2013***

- Bachelor of Science in Physics with a Minor in Mathematics, 3.36 GPA

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**SKILLS**

***Programming and Software***

- Languages: Python, C++, Java, JavaScript, Mathematica, L<sup>A</sup>T<sub>E</sub>X, MATLAB, Bash
- Libraries: matplotlib, NumPy, SciPy, SymPy, jQuery
- Frameworks: Meteor, Bootstrap, AngularJS
- Operating Systems: Ubuntu, Red Hat, Mac OS X, Windows

- Version Control: Git, SVN
- Other: Jenkins, Amazon Web Services (AWS) EC2

#### ***Instrumentation:***

- Quadrupole Mass Spectrometers
  - Operated, maintained, and executed troubleshooting of extremely sensitive \$50 million NGIMS at NASA Goddard Space Flight Center
- Piezoelectric sensors
  - Designed a low cost piezo controller Printed Circuit Board (PCB) for quantum metrology at NIST using Electronic Design Automation program KiCad

## **PUBLICATIONS**

***Strategies for choosing path-entangled number states for optimal robust quantum optical metrology in the presence of loss*** ***July 2012***

- Kebei Jiang, Chase J. Brignac, Moochan B. Kim, Hwang Lee, J. P. Dowling
- Research performed at Louisiana State University on quantum optical metrology using parity detection applied to path entangled Fock states in lossy environments
- Phys. Rev. A 86, 013826 (2012)

## **HONORS & AWARDS**

***Landsat 8 Flight Operation Team Excellence Award*** ***2016***

- For significant contributions to safeguarding the Landsat 8 mission

***Google Talk*** ***2016***

- Invited to Lenoir, North Carolina to talk about Landsat 8 at Google's data center

***Pitch Dingman*** ***2016***

- Won 2016 Pitch Dingman Competition grand prize of \$15,000 for WeCook

***LA-STEM Research Scholars Program, LSU*** ***2010 - 2013***

- Full coverage prestigious scholarship dedicated to promoting diversity in the STEM disciplines through academia, undergraduate research, and mentoring

***S-STEM Scholars Program, LSU*** ***2009 - 2013***

- Academic scholarship dedicated to promoting diversity in the STEM disciplines

## **LEADERSHIP**

***Bitcamp Hackathon Co-Executive Director*** ***2015 - 2016***

- Organized massive hackathon with over 1200 attendees that took a year of planning and coordination
- Facilitated diversity, innovation, and creativity to make new technologies
- Managed extensive team of over a dozen directors
- Balanced budget amounting to hundreds of thousands of dollars

***Startup Shell*** ***2015 - Present***

- Fostering entrepreneurship through collaboration at UMD's incubator advising startups
- WeCook was founded in the Startup Shell