William L. **Van Besien**

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Summary

Experienced, multi-disciplinary software engineer with a background in both laboratory R&D environments and tech startups. Leverages a decade's worth of experiences to refine a personal approach toward software development that optimizes for simplicity and minimizes incidental complexity. Takes pride in delivering quality products and thrives off of building productive, positive relationships with peers.

Experience

Johns Hopkins University Applied Physics Lab (JHUAPL)
Professional Staff, Embedded Applications Group, 2008-Present.

Autonomous systems. Technical lead for the fault-management subsystem on a DARPA-sponsored effort to safely test cooperative, multi-agent UAV autonomy. Responsible for the concept of the model-based reasoning engine and its implementation within the overall remediation architecture. Architected and integrated a candidate model-based, formally verifiable fault management system for the NASA Solar Probe mission.

Spacecraft flight software. Granted 2015 JHUAPL Achievement Award for work on "SpaceDrone" - a technology demonstration of the versatility of JHUAPL's mission-independent flight software on COTS multirotors. Contributed to flight software R&D efforts: aggregated and developed baseline flight software infrastructure for use in IR&Ds going forward, and contributed to an experimental branch of the open source NASA CFE flight software framework to support multicore systems. In 2012 served as a flight controller during the integration & testing, launch, and post-launch commissioning phases of the NASA Van Allen Probes mission.

Cyber security. Performed penetration tests on spacecraft testbeds, devised countermeasures using in-situ spacecraft resources, and pursued spinoff involving analysis of cyber attack and defense strategies. Published cryptographic key management solution for space Delay Tolerant Networks, and contributed to the implementation of the security extensions for the NASA JPL implementation of the Interplanetary Overlay Network (ION).

Nextility
(DC-based energy services startup). Tech team, 2013-Present (Part-Time).

Designed and implemented the SCADA system to centrally monitor, control, and diagnose faults for solar-energy installations. Introduced a scalable architecture supporting flexible deployments and enabled rapid support of new sensors, controllers, and other solar-power hardware.

Developed deployment system and contributed to our proprietary framework to collect and normalize daily pricing data from major East Coast gas and electricity utilities, essential to enabling Nextility's brokerage line-of-business.

NASA Goddard Space Flight Center
"Research Associate". Microelectronics Group, 2007.

NSF Undergraduate Fellowship
Intern. University of Mainz Institute for Nuclear Physics, 2006.

Education

M.S. and **B.S.** in **Computer Science**. George Washington University, Washington DC.

Focus in security; fully funded from 2008-10 under NSF Cyber Corps fellowship. Partially funded 2005-08 under SEAS Dean's scholarship.

Publications and Activities

◇ Recipient (with team) of a 2014 JHUAPL Achievement Award for Technical Innovation for work on **"SpaceDrone: Enterprising the APL Spacecraft Flight Software"**.
◇ Presenter, **"Investigating Model-Based Autonomy for Solar Probe Plus"**, 2013 Workshop on Spacecraft Flight Software, California Institute of Technology, Pasadena, CA. 2013.
◇ Recipient (with team) of a 2013 APL Hart Prize for Development on **"Organic Persistent Intelligence, Surveillance and Reconnaissance (OPISR)"**.
◇ Session Chair, SpaceOps 2013: Session on Space Cyber Security, JHUAPL. 2013.
◇ Reviewer, **"Penetration Testing with Raspberry Pi"**, Muniz, J., Lakhani A. (2015). Packt Publishing.
◇ Author/Presenter, **"Protecting Against DNS Cache Poisoning Attacks"**, Trostle, J., Van Besien, W., Pujari, A. (2010). 6th IEEE ICNP Workshop on Secure Network Protocols, Kyoto, Japan.

- ◇ Author/Presenter, **"Dynamic, Non-Interactive Key Management for the Bundle Protocol"**, Van Besien, W. (2010). 5th ACM MobiCom Workshop on Challenged Networks, Chicago, IL.

Technical Details

DevOps and development methodologies. Ansible, Puppet, Fabric. Agile and Test-Driven Development (TDD). Atlassian product suite for continuous integration, code reviews, SCM (Git, Mercurial). Github. Amazon cloud services.
Languages: C, Python, Java (in Linux environment). Also experienced with C++, JavaScript, PHP, Scala, Bash.
Security. Space network-level security, attack trees, pcaps, key management, countermeasures, cryptographic protocols, coursework in abstract algebra and cryptography, pairing-based cryptography.
Frameworks, middlewares, etc.: Flask, Django, Node.js. SQL. Postgres, Mongo, SQLite. NASA cFE, ZeroMQ. Google Scripts.
Misc: VxWorks for real-time embedded software, NASA spaceflight operations, Space networking, TCP/IP networking, DTN protocol suite and network architecture, SCADA, Modbus. Mentoring of early-career staff, leading from behind, conflict resolution and teambuilding.