CARLYN LEE

626-419-6597 carlyn.lee@gmail.com

Accomplished Software Engineer specializing in architecting scalable solutions, pioneering system reproducibility strategies, and innovating advanced visualization tools for high-performance computing applications. Experienced in collaboration with interdisciplinary teams, designing complex algorithms, and optimizing computing systems with a variety of tools: *C/C++, Python, Java, MATLAB, Visual Basic*

EXPERIENCE

NASA Jet Propulsion Laboratory, California Institute of Technology Aug 2012 - Nov 2024
Applications Software Engineer *Pasadena, CA*

- **Tools Development:** Built deep space mission development telecom simulation and modeling tools. Led and mentored remote interns contributing to mission-critical systems. Automated operations to enable three Deep Space Network ground antenna sites to manage the entire network during day shifts instead of operating 24/7.
- **Mission Operations:** As the Perseverance Rover telecom chair, responsible for the health and status of rover communications using data down-linked from Mars. Delivered tools reducing rover operation response-time from several hours to 20 minutes, exceeding requirements.
- **Supercomputing:** Developed Lunar terrain mask algorithms for Shaheen II supercomputer, enabling 10m-resolution link coverage maps for lunar landing sites. Parallelized simulations for Deep Space Optical Communications, achieving bit error rate of 10e-8, a 1000x improvement over previous state-of-the-art, and enabling mission performance for VIPER.
- **Fieldwork:** Responsible for reliable multi-agent data transfer processes occurring at the transport layer. Conducted field testing of autonomous systems in maritime and subterranean environments, contributing to 1st place in DARPA's Urban Circuit Challenge and the deployment of the largest ever fleet of autonomous maritime vehicles.
- **Verification & Validation:** Responsible for developing automated tools and test procedures for avionics flight software, and executing tests on flight hardware.

EXTRACURRICULAR, VOLUNTEER & PROFESSIONAL AFFILIATIONS

2019 - Present Supporting the Global Network Advancement (GNA-G) Data Intensive Sciences Working Group to enable high-throughput data transfers for Caltech, including a 10 Tbps link demonstration at the Nov 2024 Supercomputing Conference.

2018 - Present SoCal Linux Expo Volunteer, deploying on-site network infrastructure and AV systems, repurposing legacy hardware to deliver free, open-source solutions for thousands of attendees and millions of Linux users.

2014 - Present Interplanetary Small Satellite Conference committee member, managing budgets, website development, logistics, and vendor collaboration to host 100+ industry leaders advancing interplanetary satellite capabilities.

EDUCATION

California State University, Fullerton
M.S. Computer Science *August 2012*
B.S. Computer Science, Minor in Mathematics *July 2011*

K. Cheung; V. Vilnrotter; M. Sanchez-Net; C. Lee. High Data Rates from the Outer Solar System. IEEE Aerospace Conference. Big Sky, MT, USA. March 2025.

Vander Hook, J. V., Seto, W., Nguyen, V., Hasnain, Z., Lee, C.-A., Gallagher, L., Halpin-Chan, T., Varahamurthy, V., & Angulo, M. (2022). Swarms of Pirates: Red Team Exercises Using Autonomous High-Speed Maneuvering Surface Vessels. Field Robotics, 2, 872–909.

C. Lee, M. Shaikh, C.H. Lee and D. Michels. Lunar Terrain Coverage Analysis Data Delivery Workflow, AIAA 2021-4039. ASCEND 2021. November 2021.

A. Agha et al.. NeBula: Quest for Robotic Autonomy in Challenging Environments; TEAM CoSTAR at the DARPA Subterranean Challenge. Journal of Field Robotics, 2021.

C. Lee, H. Xie, C.H. Lee, D. Lyakhov, and D. Michels. In Silico Methods for Space System Analysis: Optical Link Coding Performance and Lunar Terrain Masks. In AIAA ASCEND, Las Vegas, NV, 16-18 Nov. 2020.

D. Abraham, B. MacNeal, D. Heckman, Y. Chen, J. Wu, K. Tran, A. Kwok and C. Lee. Recommendations Emerging from an Analysis of NASA's Deep Space Communications Capacity. In International Conference On Space Operations (SpaceOps 2018), Marseille, France, May 2018.

J. Lad, M. Johnston, D. Tran, D. Brown, K. Roffo, and C. Lee. Complexity-Based Link Assignment for NASA's Deep Space Network for Follow-the-Sun Operations. In International Conference On Space Operations (SpaceOps 2018), Marseille, France, May 2018.

K. Pinover, M. Johnston, C. Lee. Optimizing SmallSat Scheduling for NASA's Deep Space Network. In International Workshop on Planning and Scheduling for Space (IWPSS 2017). Pittsburgh, PA, June 2017.

D. Morabito, D. Kahan, K. Oudrhiri, and C. Lee. Cassini Downlink Ka-Band Carrier Signal Analysis. The Interplanetary Network Progress Report, Volume 42-208, February 15, 2017.

K. Cheung, D. Abraham, M. Sanchez-Net, K. Tran, C. Lee. Traffic modeling for Deep Space Network in the Human Exploration Era. In SpaceOps 2016 Conference, Daejeon, Korea, May 16-20, 2016.

M. Johnston, C. Lee, C. Lau, K. Cheung, M. Levesque, B. Carruth, A. Coffman, M. Wallace. Integrating space communication network capabilities via web portal technologies. In SpaceOps 2014 13th International Conference on Space Operations, Pasadena, California, May 5-9, 2014.

C. Lee, C.H. Lee. Cancer Screening Using Multi-modal Differential Principal Orthogonal Decomposition. In 2013 13th International Conference on Computational Science and Its Applications, Ho Chi Minh City, Vietnam, June 24-27 2013.

C. Lee, C.H. Lee. Extended Principal Orthogonal Decomposition Method for Cancer Screening. International Journal of Bioscience, Biochemistry and Bioinformatics vol. 2, no. 2, pp. 136-141, 2012.

C. Lee. Rest architecture for link analysis tools portal. NASA Undergraduate Student Research Program (USRP), Pasadena, California, August 2011.