Anh Ngoc Nguyen

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RELATED WORK EXPERIENCE

AST, Technical Manager *[Detail]* **Nov 2022 – Jan 2023**
NASA Amstrong Flight Research Center, Edwards Air Force Base, CA

AST, Aerospace Engineer **Jan 2017 – Nov 2022**
NASA Ames Research Center, Moffett Field, CA

Summary

- Payload & Technical Management for multiple NASA Space Technology Mission Directorate Small Spacecraft Technology and Flight Opportunities Program cross-cutting technology demonstrations
- Experience in identification, evaluation, and selection of suborbital technologies for orbital demonstrations in alignment with agency and mission directorate goals and strategies for future architectures
- Experience in working directly with multiple programs across multiple centers, originating and managing contracts and agreements, managing personnel, schedule, risk, cost, and technical scope and direction of projects.
- Experience in cradle-to-grave technology demonstration missions: mission concept development, requirements definition, spacecraft architecture and development, assembly, integration and test, environmental testing, executing mission operations, and project close-out.
- Technical Lead and Monitor for university grants, partnerships with other NASA centers, commercial industry, and other government entities in alignment with agency, mission directorate, and programmatic strategic goals
- Technical Contributor to Small Spacecraft community in engaging in public outreach, lessons learned forums, community of practice seminars, collaborative project panels, and more
- Contracting Officer Representative Certified, managing complex contracting work packages across multiple agencies and contracts

Flight Projects & Studies

- NASA STMD-SST PY4 *Technical Manager* – Four 1.5U mesh networking demonstration GPS-denied precision ranging, cross-link/down-link, 3-axis magnetorquer-only pointing and formation flying, and coordinated radiation measurement w/ Carnegie Melon University PI Z. Manchester. V-R3x follow-on. (Launch Jun 2023)
    - Collaborators: Carnegie Melon University
- NASA STMD-SST R5 *Technical Monitor* –Series of 3U & 6U rapid, low-cost, CubeSat demonstrations in collaboration with NASA JSC. (Launch Jul 2023, Sep 2023)
- NASA STMD-SST PACE-2 (Payload Accelerator for CubeSat Endeavors) *Project Manager* – Second of the PACE-ADP series of 6U CubeSats. Demonstration of the second generation ADP avionics and payload suite.
    - Collaborators: NASA JSC, Stellar Exploration, Amazon Web Services Ground Station

- NASA STMD-SST/FO & NIWC SOLD (Stratospheric Optical Link Demonstration) *Project Manager* and *Technical Lead for NRU IAA* – Suborbital high-altitude balloon demonstration of 2-way optical communications with mobile optical ground station. Will characterize the stratosphere and verify/validate future optical comm link budgets
    - Collaborators: Naval Information Warfare Center (NIWC) Pacific
- NASA MAE (Mars Airborne Explorer) *Small Satellite and Launch Specialist* – Technology demonstration of an Airborne instrument at Mars (Currently Pre-phase A)
    - Collaborators: NASA AFRC, JPL
- NASA STMD-SST PACE-1 *Project Manager* – First 6U of the PACE-ADP series of CubeSats. Demonstration of the ADP avionics and various payloads. (Launched Jun 202)
    - Collaborators: NIWC, NASA ARC ADP Payload Developers, Stellar Exploration, Amazon Web Services Ground Station
- NASA STMD-SST/Axient ESW (Experimental SmallSat Working Group) Suborbital Mission 1 *Technical Advisor* – Early-career and intern led demonstration of communication utilizing two home-grown 6U avionics architecture on two separate high-altitude balloons. (Campaign Sep 2022)
    - Collaborators: Axient, University of Maryland
- NASA STMD-AES NGAT (Next Generation Animal Tracker) *Technical lead* – Study and demonstration of next generation animal trackers utilizing SST technologies. (Currently Pre-phase A)
    - Collaborators: University of Colorado, Carnegie Melon University, Bureau of Ocean and Energy Management
- NASA STMD-SST & FO V-R3x (Suborbital) *Project Manager* – Five 1U mesh networking demonstration (1 Balloon, 4 Mobile Terrestrial) demonstrating high precision ranging, cross-link/down-link. Follow-on demonstration of V-R3x Orbital Tech Demo (Campaign Mar 2021)
    - Collaborators: Carnegie Melon University, Stanford University
- NASA STMD-SST V-R3x (Orbital) *Project Manager* – Three 1U CubeSats demonstrating high precision ranging, cross-link/down-link, and coordinated radiation measurement w/ Stanford University PI Z. Manchester (Launched Jan 2021)
    - Collaborators: Stanford, Carnegie Melon University, Amazon Web Services
- NASA STMD-SST KickSat-2 *Deputy Project Manager & Systems Engineer* – Deployment of 105 chip satellites from a 3U CubeSat demonstrating next generation swarm communications (Launched Mar 2019)
    - Collaborators: Stanford, Carnegie Melon University, SRI Institute Ground Station
- NASA STMD-SST & AES CHOMPTT [CubeSat Handling of Multisystem Precision Time Transfer] *Deputy PM, Systems Engineer* – 3U Laser Time Transfer CubeSat (Launched Dec 2018)
    - Collaborators: University of Florida, SRI Institute Ground Station
- NASA SMD ESD SBG Augmenting Constellation Study *Study Lead* – Investigation of the performance and cost of sereral CubeSat-to-MicroSat-class constellations that can augment a Class-C VSWIR/TIR Surface Biology and Geology mission (Pre-phase A Jul 2020)
    - Collaborators: NASA GSFC, JPL, Langley, MSFC
- NOAA 5GIIS *CubeSat Study Lead* (Pre-phase A Dec 2019)
    - Collaborators: NOAA
- NASA STMD-SST R2D2 (Rapid Reaction Development and Demonstration) *Mission Architect, Mission Operations* (Phase A 2019)
- NASA STMD-SST Lunar GPR Study *Systems Engineer* (Pre-phase A 2019)
- NASA ARC MDC Aeolus Study *ADCS SME*, Selected ROSES 2016 PS3DS proposal (Pre-phase A 2016)
- NASA STMD-SST Starling *ADCS SME* (Phase A 2018)

- NASA STMD-SST CLICK [CubeSat Laser Intersatellite Crosslink] *Mission Architect, Systems Engineer* w/ MIT PI K. Cahoy, UF Co-I J. Conklin (Pre-phase A, and Phase A 2018)
- NASA ARC Planetary Auto-rotating Decelerator [PAD] *Principal Investigator* (CIF 2018)
- NASA ARC Gray-scale Modulation for CubeSat Optical Communications *Co-I* w/ PI R. de Rosee (NASA ARC) (CIF 2018, IRAD 2018)
- NASA ARC Modular Gravitational Reference Sensor for Instrument Technologies for Small Spacecraft STTR Co-I w/ PI R. Byer (Stanford University) (2018)
- NASA STMD-SST CubeQuest Centennial Challenge ADCS SME (2015)

OUTREACH

- NASA SmallSat LEARN Forum Panelist – Oct 2022 (in-person)
- NASA TechRise Virtual Field Trip Panelist – Sep 2022
- NASA TechFlights Reviewer – Aug & Dec 2022
- Draw Together Outreach and Activity – May 2022
- NASA SmallSat LEARN Forum Panelist – Mar 2022
- NASA TechLeap Reviewer and Panelist – Sep 2021
- NASA S3VI, FO, and Code P Community of Practice V-R3x Mission Overview and Lessons Learned Seminars – Jun, Aug, Nov 2021
- Stanford Guest Lecture for AA131 - Space Flight course – Nov 2021
- International Space University (ISU) Guest Lecture on CubeSats and ADCS Systems – May 2021
- University of Fullerton Guest Lecturer on Small Satellites – Apr 2021
- NASA Small Satellite Tech Forum Panelist – Apr 2021
- Alaska Space Consortium Guest Lecture on Small Satellites – Feb 2021
- California Space Grants Webinar Guest Lecture on Small Satellites – Dec 2020
- CubeSat Workshop, SmallSat Conference Outreach – Aug 2016 – 2022
- National Week at the Labs – March 2017
- Silicon Valley ComiCon – Apr 2017
- Self-eSTEM Day with Oakland Girls – July 2017

EDUCATION

University of Florida, *Gainesville, FL* Aug 2012 – May 2016
PhD and MS, Aerospace Engineering with focus in Dynamics Systems and Controls
Dissertation: Drag-free Control and Drag Force Recovery on Small Satellite Platforms
MS degree awarded: May 2014
PhD degree awarded: May 2016

California State University East Bay, *Hayward, CA* Jan 2010 – Jan 2011
BS, Computer Engineering with minor in Computer Science
Degree Awarded: Jan 2011

University of California, Santa Barbara, *Santa Barbara, CA* Sep 2006 – Dec 2009
Computer Engineering

RELEVANT SOFTWARE

MATLAB, Satellite Tool Kit (STK), SolidWorks CAD, Microsoft Visual Studio, Microsoft Office Suite, Proficient in C, C++, Python, Qt.

RELEVANT COURSE WORK

Analytical Dynamics, Spacecraft Attitude Determination and Control, Guidance and Control of Aerospace Vehicles, Control System Theory, Nonlinear Control, Optimal Controls, Geometry of Mechanical Robots, Principal Engineering Analysis, Materials Science, Computer Architecture, Data Structures and Algorithms, Computer Architecture, Electric Circuit Theory, Digital Signal Processors, Numerical Analysis, Numerical Linear Algebra, Mathematical Methods in Physics and Engineering.

RELEVANT TRAINING

IPC J-STD-001 Solder Certified, NASA ESD Certified, ARC Respirator Certified, ARC Foreign National Escort Trained, NASA ARC Radiation Safety Trained, NASA COR Certified

PROFESSIONAL SOCIETIES

American Radio Relay League (ARRL), Professional Member	2016 – Present
American Institute of Aeronautics and Astronautics (AIAA), Professional Member	2014 – Present
Society of Women Engineers (SWE), Student Member	2014 – 2016
Institute of Electrical and Electronics Engineers (IEEE), Student Member	2012 – 2016

OTHER WORK EXPERIENCE

Summer Associate Mar 2014 – Jan 2017

Millennium Engineering Integration Co., Mountain View, CA

Summer associate at NASA ARC Mission Design Center. Roles include: Systems Engineer, Electrical Engineer, ADCS SME, Proposal Editor, and Division Outreach.

Systems Engineer – *University of Florida, Gainesville, FL* Jun 2014 – May 2016

- Mentored a group of 6-8 undergraduates to develop a completely numerical 6 degree-of-freedom MATLAB simulation for the CHOMPTT spacecraft
- Performed the initial investigation of the feasibility of the integration UF Optical Precision Time-transfer Instrument (OPTI) payload with the NASA ARC EDSN bus during the Summer of 2015 at NASA Ames Research Center
- Lead in the integration and coordination between the UF and ARC teams in Fall 2015 and Spring 2016
- Further developed satellite laser ranging facility operations, mechanical integration, assembly testing requirements, and ICD

Graduate Research Assistant – *University of Florida, Gainesville, FL* Jan 2013 – May 2016

- Developed a completely numerical 12 degree-of-freedom simulation in MATLAB for the dynamics and control of a drag-free spacecraft with a processor-in-the-loop demonstration of real-time control algorithms and Extended Kalman Filter on a flight-ready digital signal processor
- Developed external disturbance force models for atmospheric drag (a function of atmospheric density and upper atmospheric horizontal winds), solar radiation pressure, and earth radiation pressure.
- Simulated and validated control and stability for a single-thruster drag-free 3U CubeSat, drift-mode accelerometer for a small spacecraft (250 kg), and hybrid control moment gyro reaction wheel system for a 3U CubeSat

- Developed and validated estimation techniques for external disturbance-force recovery of drag-free spacecraft

Summer Intern – *NASA Ames Research Center, Mountain View, CA* Jun 2015 – Sep 2015

- Initial investigation of OPTI and EDSN integration (see description denoted with *)

Graduate Teaching Assistant – *University of Florida, Gainesville, FL* Jan 2013 – May 2016

- Course assignents: Dynamics and Controls System Design Laboratory (Spring 13/14/15), Engineering Mechanics -Dynamics (Fall 13/14, Spring 14/15), and Mechanics of Materials (Summer 14).

Software Engineer II – *EMD Millipore , Hayward, CA* Nov 2010 – Aug 2012

- Developed assay software for the InCyte Cell Analysis application for EMD Millipore flowcytometry platforms in C/Qt
- Developed a proof of concept for the Muse™ Cell Analysis application on a 7-inch touch-screen for a completely integrated, portable, and low-cost instrument. Winner of the Red Dot Product Design 2012 award
- Developed micro-capillary assembly quality testing software in C++
- Trained sales representatives on EMD Millipore InCyte and Muse cell analysis applications

PUBLICATIONS & PRESENTATIONS

B. Yost, S. Weston, C. Burkhard, **A. N. Nguyen**, J. Stupl, J. Fishman "Learning from past missions for today's case studies", 35th Annual Small Satellite Conference, Logan, UT, August (2022).

A. N. Nguyen, "PACE-2 and Beyond", 35th Annual Small Satellite Conference, Logan, UT, August (2022).

R. Hunter, E. Agasid, C. Baker, J. Treptow, C. Frost, D. Mayer, A. Guarneros Luna, R. De Rosee, **A. N. Nguyen**, J. Fishman, "NASA Small Spacecraft Technology (SST) Program and Recent Technology Demonstrations", 4S Symposium, Portugal, Spain (May 2022)

A. N. Nguyen, "NASA Flight Opportunities – a Stepping Stone to Orbit", 34th Annual Small Satellite Conference, Logan, UT (Aug 2020)

S. Horst, J. Chrone, S. Deacon, C. Le, A. Maillard, A. Molthan, **A. N. Nguyen**, B. Osmanoglu, S. Oveisgharan, M. Perrine, R. Shah, E. Tymofyeyeva, C. Wells, A Zufall, P. Rosen "NASA's Surface Deformation and Change Study", IEEE Conference on Aerospace, Big Sky, MT (Mar 2022)

D. Coogan, T. Ritz, M. Clark, J. W. Conklin, N. Belsten, K. Cahoy, B. Osmanoglu, S. Oveisgharan, A. Nguyen, P. Rosen "Estimation and Timing Performance with Pulsed Laser Links for Small Satellite PNT", CubeSat Developers Workshop, San Luis Obispo, CA (Apr 2022)

J. W. Conklin, **A. N. Nguyen**, "Preliminary Results from the CHOMPTT Laser Time-Transfer Mission", 33rd Annual Small Satellite Conference, Logan, UT, August (2019).

A. N. Nguyen, J. W. Conklin, "Small Satellite Technologies for Drag-free Control and Drag force Recovery", 31st Annual Small Satellite Conference, Logan, UT, August (2016).

A.N. Nguyen, W. Attai, N. Barnwell, M. Carrasquilla, J. Chavez, O. Formoso, J. Hanson, B. Jaroux, A. Nelson, T. Noel, S. Nydam, K. Oyadomari, J. Pease, F. Pistella, C. Prisca, T. Ritz, S. Roberts, P. Serra, J. Stupl, E. Waxman, J. Wolfe and J.W. Conklin, "CubeSat Demonstration of Sub-nanosecond Optical Time

Transfer", 10th Annual Stanford Position, Navigation and Time Symposium, Palo Alto, CA, November (2016).

A.N. Nguyen, "NASA Ames Research Center Emerging Technologies in Position, Navigation and Time", AFRL PNT Workshop, Albuquerque, NM, October (2016).

A.N. Nguyen, and J.W. Conklin "Control Design and Simulated Performance of a Drift-mode Accelerometer." Journal of Spacecraft and Rockets (Submitted September 2016).

A.N. Nguyen, and J.W. Conklin, "Three-Axis Drag-Free Control and Drag Force Recovery of a Single-Thruster Small Satellite." Journal of Spacecraft and Rockets 52.6 (2015): 1640-1650.

N. Barnwell, W. Attai, L. Bassett-Audain, M. Carrasquilla, J. Chavez, J. DeWald, O. Formoso, J. Hanson, B. Jaroux, A.Nelson, T. Noel, **A. N. Nguyen**, S. Nydam, J. Stupl, E. Waxman, J. Wolfe, and J. W. Conklin " CubeSat Handling of Multisystem Precision Time Transfer", 30th Annual Small Satellite Conference, Logan, UT, August (2016).

S. H. Hong, **A. N. Nguyen**, J. W. Conklin, "Estimation of Spherical Harmonic Geopotential Coefficients for Drag-free Satellite-to-Satellite Tracking Missions", 10th International LISA Symposium, Gainesville, FL, May (2014).

A. N. Nguyen, J. W. Conklin, "Dynamics and Control Design for the Drag-free Small Satellite", 10th International LISA Symposium, Gainesville, FL, May (2014).

J. W. Conklin, S. H. Hong, **A. N. Nguyen,** P. Serra, K. Balakrishnan, S. Buchman, D. B. DeBra, E. Hultgrin, A. Zoellner, "Drag-free Small Satellite Platforms for Future Geodesy Missions", American Geophysical Union Fall Meeting, December (2013).

A. N. Nguyen, S. H. Hong, J. W. Conklin, S. Buchman, E. Hultgrin, A. Zoellner, C. Zanoni, "Dynamics and Control Design for the Drag-free CubeSat", 2013 Spring CubeSat Developers' Workshop, San Luis Obispo, CA, April (2013).

J. W. Conklin, **A. N. Nguyen**, S. Hong, S. Buchman, R. Byer, G. Cutler, D. DeBra, E. Hultgren, "Small Satellite Constellations for Earth Geodesy and Aeronomy", 10th Annual Summer CubeSat Developers' Workshop, August (2013).