

Education

2018 – 2024	University of California, Berkeley Ph.D. Mechanical Engineering (<i>expected Aug 2024</i>) Major Field: MEMS/Nanoscale Science and Engineering Minors: Education, Materials Science, Physical Electronics & Devices Advancement to Candidacy: 04/2022; Coursework Completed: 05/2020; Preliminary Exam: 01/2019 M.S. Mechanical Engineering (<i>expected Dec 2023</i>) Thesis: <i>“Micro Electro-Mechanical Systems for Low-Cost Interplanetary Solar Sails”</i> Advisors: Prof. Liwei Lin (Mech. Engr.) and Prof. Kristofer Pister (Elec. Engr.)	Berkeley CA, USA
2017 – 2018	University of Toronto (one-year study abroad) U.S. Fulbright Student Fellowship Advisors: Prof. James Drake (Neuro.) and Prof. Andrew Goldenberg (Bio. Engr.)	Toronto ON, CAN
2014 – 2017	University of California, Irvine (UCI) B.S. Mechanical Engineering, Specialization in Materials and Mechanical Design Advisor: Prof. David Reinkensmeyer (Mech. Engr.) B.S. Aerospace Engineering, Specializations in Flow Physics and Propulsion Systems Advisor: Prof. Robert Liebeck, (Aero. Engr.) B.S. Materials Science and Engineering Advisors: Prof. Michelle Khine (Biomed. Engr.) and Prof. Chris Hoo (Mat. Sci.)	Irvine CA, USA
2011 – 2014	Los Angeles Pierce College (LAPC) A.S. Pre-Engineering A.S. Mathematics A.A. Humanities A.A. Social and Behavioral Sciences A.A. Science, Technology, Engineering, and Math Advisors: Prof. Lee Loveridge (Phys.), Prof. Maria Perser (Psy.), & Prof. Elizabeth Cheung (Ind. Engr.)	Woodland Hills CA, USA

Current Research Projects

Berkeley Autonomous Microsystems Laboratory (BAMLAB): **PhD Research Fellow** Jan 2020 – Aug 2024

Research Projects (5 total):

- 1) Small solar sails directly actuated by MEMS for deep space exploration and near-earth orbit object identification.
- 2) Millimeter scale autonomous, solar powered, quadrupedal walking silicon micro-robot.
- 3) Self-Righting microrobot with 4- and 3-bar linkage actuator design.
- 4) 3DOF micro-shoulder using MEMS+3DP.
- 5) Transmission capable inchworm motors.

Liwei Lin Laboratory: **PhD Research Fellow**

Aug 2018 – Aug 2024

Research Projects (2 total)

- 1) Ultrasonic sensors for anti-biased epidermal heart monitoring.

Fellowships, Scholarships, Grants, and Patent(s)

- ✓ 2022 Hearts to Humanity Eternal Fellowship
- ✓ 2021 Berkeley Diversity & Community Fellowship
- ✓ 2021 Robert P. Lin Graduate Fellowship (Space Sciences Laboratory)
- ✓ 2020 Berkeley Diversity & Community Fellowship
- ✓ 2020 Patent No. 62/833,549: Endoscopic Multi-Tool
- ✓ 2019 National Science Foundation Graduate Resource Fellowship Program (NSF GRFP) Award
- ✓ 2019 Ford Foundation Predoctoral Fellowship Award
- ✓ 2018 Berkeley Chancellor’s Fellowship for Graduate Study
- ✓ 2018 National GEM Ph.D. Fellowship
- ✓ 2017 U.S. Fulbright Student Research Fellowship

Journal Publications and Conference Papers

In Preparation

- J1. [A. N. Alvara](#), O. Aceves, K. S. J. Pister. "Design and Fabrication of a MEMS & 3D Printed 3DOF Shoulder for Microrobots." 2024 IROS. **In preparation for publication.**
- J2. [A. N. Alvara](#), Y. Liu, D. Lovell, D. Teal, L. Lin, K. S. J. Pister. "A Comparative Study of Transmission Capable GCAs and Inchworm Motors for Microrobotic Applications." 2024. MARSS. **In preparation for publication.**
- J3. [A. N. Alvara](#), H. Gomez, D. Teal, D. Acker-James, L. Lin, K. S. J. Pister. "Non-Inertial Study of a Self-Righting Mechanism for Silicon Microrobots." 2024. MEMS. **In preparation for publication.**
- J4. [A. N. Alvara](#), H. Gomez, D. Teal, D. Acker-James, L. Lin, K. S. J. Pister. "Millimeter-Scale Quadrupedal Walking Silicon Robots." 2023. ICRA IEEE. **In preparation for publication.**
- J5. [A. N. Alvara](#), D. Lovell, H. Gomez, A. J. Westphal, L. Lin, K. S. J. Pister. "MEMS Control of Small Solar Sails for Cometary Sample Retrieval." 2023. MARSS. **In preparation for publication.**
- J6. [A. N. Alvara](#), E. Sin, L. Lee, N. Lambert, J. Westphal, K. S. J. Pister. "BLISS: Interplanetary Exploration with Swarms of Low-Cost Spacecraft." 2023. Acta Astronautica. **In preparation for publication.**

Published

- J7. K. W. Eastwood, A. Swarup, P. Francis, [A. N. Alvara](#), H. Chen, T. Looi, H. E. Naguib, J. M. Drake "A Steerable Neuroendoscopic Instrument Using Compliant Contact-Aided Joints and Monolithic Articulation," ASME Jnl. of Medi. Dev. 2020
- J8. [A. N. Alvara](#), T. Looi, R. Saab, A. Shorter, A. Goldenberg, J. Drake "Development and Validation of MRI Compatible Pediatric Surgical Robot with Modular Tooling for Bone Biopsy," 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Madrid Spain 2018
- J9. S. Pearlman, [A. N. Alvara](#), R. Gutierrez, L. Mejia, S. Kelly, C. Hoo, and M. Khine, "Quantifiable Detection of Gluten Concentration on a Smartphone Platform," Undergraduate Research Opportunities Program Symposium (UROP) 2015. Irvine
- J10. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Investigation of Soft Robotic Exosuit for Rehabilitative Use," UROP 2015. Irvine CA
- J11. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Exploring the Use of Motorized Upper Arm Exosuits for Force Enhancement," UROP 2015. Irvine CA

Invited Research Talks and Oral Presentations

- T1. [A. N. Alvara](#). "BLISS: Low-Cost Interplanetary Solar Sails". Spring 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- T2. [A. N. Alvara](#), T. Looi, R. Saab, A. Shorter, A. Goldenberg, J. Drake "Development and Validation of MRI Compatible Pediatric Surgical Robot with Modular Tooling for Bone Biopsy," 2018 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Madrid Spain 2018
- T3. [A. N. Alvara](#), T. Looi, R. Saab, A. Shorter, A. Goldenberg, J. Drake, "Validation of Kinematic Registry and MRI Compatibility for Pediatric Surgical Robot with Modular Tooling for Bone Biopsy," The 11th Annual Hamlyn Symposium for Medical Robotics, London UK, 2018
- T4. S. Pearlman, [A. N. Alvara](#), R. Gutierrez, L. Mejia, S. Kelly, C. Hoo, and M. Khine, "Quantifiable Detection of Gluten Concentration on a Smartphone Platform," Undergraduate Research Opportunities Program Symposium (UROP) 2015. Irvine
- T5. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Investigation of Soft Robotic Exosuit for Rehabilitative Use," UROP 2015. Irvine CA
- T6. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Exploring the Use of Motorized Upper Arm Exosuits for Force Enhancement," UROP 2015. Irvine CA
- T7. [A. N. Alvara](#), H. Zhao, D. Khan, and R. Shepherd, "Linearization of Movement and Improvement of Manufacturing Techniques for Pneumatically Operated Soft-Robotic Actuators". SACNAS 2015 National Conference. Washington DC.
- T8. [A. N. Alvara](#), H. Zhao, D. Khan, and R. Shepherd, "Linearization of Movement and Improvement of Manufacturing Techniques for Pneumatically Operated Soft-Robotic Actuators". Cornell University LSAMP and McNair Symposium 2015. Ithaca NY.

Poster Presentations

BSAC Internal Advisory Board (IAB) Meetings

- C1. [A. N. Alvara](#). "Walking Silicon Robots." Spring 2023. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C2. [A. N. Alvara](#), L. Lee. "Berkeley Low-cost Interplanetary Solar Sails (BLISS)." Spring 2023. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C3. [A. N. Alvara](#). "Walking Silicon Robots." Fall 2022. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA

- C4. [A. N. Alvara](#), L. Lee. "Berkeley Low-cost Interplanetary Solar Sails (BLISS)." Fall 2022. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C5. [A. N. Alvara](#), N. Lambert, E. Sin, L. Lee. "Berkeley Low-cost Interplanetary Solar Sails (BLISS)." Fall 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C6. [A. N. Alvara](#). "Self-Righting for Micro Robots." Fall 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C7. [A. N. Alvara](#). "Miniature Autonomous Rockets." Fall 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C8. [A. N. Alvara](#). "Walking Silicon Robots." Fall 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C9. [A. N. Alvara](#), N. Lambert, E. Sin, L. Lee. "Berkeley Low-cost Interplanetary Solar Sails (BLISS)." Spring 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C10. [A. N. Alvara](#). "Self-Righting for Micro Robots." Spring 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C11. [A. N. Alvara](#). "Miniature Autonomous Rockets." Spring 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C12. [A. N. Alvara](#). "Walking Silicon Robots." Spring 2021. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C13. [A. N. Alvara](#), N. Lambert, E. Sin. "Berkeley Low-cost Interplanetary Solar Sails (BLISS)." Fall 2020. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C14. [A. N. Alvara](#). "Miniature Autonomous Rockets." Fall 2020. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C15. [A. N. Alvara](#), H. Gomez. "Self-Righting for Micro Robots." Fall 2020. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA
- C16. H. Gomez, [A. N. Alvara](#). "Walking Silicon Robots." Fall 2020. BSAC Semi-annual Research Review & Industrial Advisory Board (IAB) Meetings. Berkeley, CA

Conferences

- C17. A. J. Westphal, K. S. J. Pister, [A. N. Alvara](#), "Rapid Multi-Comet Sample Return Using Swarms of Tiny Interplanetary Spacecraft", August 2021. 84th Annual Meeting of the Meteoritical Society. LPI Contribution No. 2609, id.6174
- C18. [A. N. Alvara](#), T. Looi, R. Saab, A. Shorter, A. Goldenberg, J. Drake, "Validation of Kinematic Registry and MRI Compatibility for Pediatric Surgical Robot with Modular Tooling for Bone Biopsy," The 11th Annual Hamlyn Symposium for Medical Robotics, London UK, 2018
- C19. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Development of an Exosuit for Rehabilitative Use and Upper Arm Force Amplification," AAAS Annual Conference 2017. Boston MA.
- C20. [A. N. Alvara](#), S. Pearlman, R. Gutierrez, L. Mejia, S. Kelly, C. Hoo, and M. Khine, "Quantifiable Detection of Gluten Concentration on a Smartphone Platform," BioACCELL 2015. Irvine CA

Symposia

- C21. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Investigation of Soft Robotic Exosuit for Rehabilitative Use," UROP 2015. Irvine CA
- C22. [A. N. Alvara](#), L. E. Vazquez, M. B. Jakovljevic, J. D. Lopez, and D. J. Reinkensmeyer, "Exploring the Use of Motorized Upper Arm Exosuits for Force Enhancement," UROP 2015. Irvine CA
- C23. [A. N. Alvara](#), H. Zhao, D. Khan, and R. Shepherd, "Linearization of Movement and Improvement of Manufacturing Techniques for Pneumatically Operated Soft-Robotic Actuators," Ana G. Mendez University Systems Symposium 2015. San Juan, PR
- C24. A. LaVelle, M. Wijetunga, K. Williams, A. Nguyen, [A. N. Alvara](#), M. Antimie, L. Peiris, E. Coombs, M. Sherif, D. Reinkensmeyer, and J. Stupar, "Investigation of Unmanned Drones for Search and Rescue". UROP Symposium 2014. Irvine CA
- C25. [A. N. Alvara](#) and P. Gangopadhyay, "The Influence of Ordered Nanostructured Carbon Electrodes on Supercapacitor Performance," Integrated Optics for Undergraduate Native Americans program and Center for Integrated Access Networks Symposium 2014. Tucson AZ

Invited Speaker: Research, Academia, and Scholarship

Date	Role	Event Name	Organization
05/07/2022	Keynote	Bay Area GPS 2022	Bay Area Graduate Pathways to STEM
04/29/2022	Speaker	Community College Worksho	SACNAS Grad Chapter at UC Berkeley
09/22/2020	Panelist	NSF Application Workshop	UC Berkeley Graduate Division
09/09/2020	Speaker	Fellowship Writing Workshop	SACNAS at UC Berkeley
08/16/2020	Panelist	Fulbright Diversity Panel	Informed BIPOC, Asian, and LGBTQ+ of Fubright Fellowship

04/30/2020	Speaker	Navigating STEM @ Cal	UC Berkeley Office for Grad Diversity
04/15/2020	Speaker	Staying Motivated	Society for Hispanic Professional Engineers (SHPE) at UC Irvine
10/16/2019	Panelist	Ford Fellowship Workshop	UC Berkeley Office for Grad Diversity
03/06/2019	Panelist	HES Grad Student Talk	Hispanic Engineers and Scientists (HES) at Cal
11/03/2018	Panelist	GWE Parent Education	Graduate Women in Engineering (GWE) at Cal
06/21/2017	Panelist	SOP Winners Panel	Scholarship Opportunities Program (SOP) at UC Irvine
10/11/2016	Panelist	How to Study for Midterms	First-Years Program with Access and Inclusion at UC Irvine

Leadership Experience

Dates	Employer/Organization/Campus Dept	Team Size	Position/Title
Feb 2020 – June 2023	Graduate Association of Latinx Students	5	Internal Relations Chair
June 2020 – June 2023	Bias Busters	6	Co-President
Aug 2019 – June 2022	SACNAS at Berkeley	8	Co-President
June 2019 – June 2022	LAGSES UC Berkeley	10	Social Co-Chair
Oct 2018 – May 2021	Bay Area GPS	15	Board Member
Aug 2017 – June 2018	Hospital for Sick Children	14	Hamlyn Project Team Lead
Oct 2016 – Dec 2016	AVL Inc./ D. C. Kruse LLC	5	Combustion Team Lead
May 2015 – June 2016	Biorobotics Research	5	Exosuit Team Lead
Dec 2014 – June 2015	Unmanned Search & Rescue Research	8	Fuselage Team Lead
Aug 2015 – June 2017	KAMP-G Technologies	5	Team Tech Lead
May 2008 – Jan 2009	Starbucks Coffee Company	12	Shift Lead

Community Engagement and Academic Development

Dates	Organization	Grade Level	Current Role
Feb 2020 – May 2023	Bias Busters at Berkeley	Grad	Co-President
Dec 2019 – May 2022	Graduate Association of Latinx Students (GALS)	Grad	Internal Relations Chair
Aug 2019 – May 2022	SACNAS at Berkeley	Grad	President
June 2019 – May 2022	LAGSES at Berkeley	Grad	Social Co-Chair
Oct 2018 – May 2022	Bay Area Graduate Pathways to STEM (BA-GPS)	UGrad	Peer Mentor Chair
Aug 2018 – Dec 2019	Mech. Eng. Graduate Student Council (MEGSCo)	Grad	Mentor
Aug 2018 – Dec 2020	Bay Area Scientists in Schools (BASIS) Program	4 th Grade	Scientist Guest Lecturer
Aug 2018 – Dec 2020	Be a Scientist (BAS) Program	7 th Grade	Volunteer Group Teach
Aug 2017 – June 2018	1 st Int'l SHPE Chapter: Toronto, Canada	UGrad	Founder/Chair
Oct 2016 – Dec 2016	"New Students in STEM" Panel at UCI	UGrad	Panelist
Aug 2016 – June 2017	UCI Scholarship Opportunities Program	UGrad	Peer Mentor
Oct 2015 – Present	SHPE MentorSHPE Program	UGrad	Mentor (3x)
Oct 2015 – Mar 2017	Access and Inclusion 4.0 Club	UGrad	Coordinator
Oct 2014 – Dec 2016	UCI LSAMP Office	UGrad	Volunteer
Jan 2014 – Mar 2015	Engineering Student Panel at LAPC	Transfers	Panelist
June 2011 – June 2014	LAPC Tutoring Center	Transfers	Volunteer Tutor/TA

Review Committee Experience (Publications, Awards, Research)

Dates	Journal/Conference/Award
Dec 2022 – Feb 2023	MIT Summer Research Program (MSRP) Reviewer
Dec 2021 – Feb 2022	MIT Summer Research Program (MSRP) Reviewer
June 2020 – Aug 2020	2020 Great Minds in STEM (GMiS) Scholarship Award Reviewer
Mar 2020 – Apr 2020	2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) Conference Reviewer
Jan 2020 – Feb 2020	2020 International Symposium on Medical Robotics (ISMR) Conference Reviewer
Dec 2019 – Feb 2020	MIT Summer Research Program (MSRP) Reviewer

Academic Events Coordinated – many more, needs update

Date	Event Name	Organization	Description
2020-2022	Bay Area SACNAS Grad App Workshop: Bio Edition!	SACNAS @UCSF, @UCBerkeley, @Stanford	Annual one day conference for URM/first gen students about grad school
2020-2023	Fellowship Writing Workshop	SACNAS @UCBerkeley	Annual event on what fellowships there are and how to get them
2019-2022	Bay Area Graduate Pathways to STEM (GPS) Conference	Stanford & UC Berkeley College of Engineering	Annual one day conference for URM/first gen students about grad school
2019-2020	Online Activism in Support of BLM	Bias Busters, LAGSES, & SACNAS	Weekly beginners activism event in support of BLM
2019-2020	Implicit Bias Training	Bias Busters	Training for labs on implicit biases.
2019-2020	Fellowship Seminar	SACNAS at Cal	Annual event on getting fellowships
2019-2020	Demystifying the Postdoc	SACNAS at Cal	Annual event on what a postdoc is
2019-2020	REU Info Talks	SACNAS at Cal	Event to inform undergrads about REUs
2019	Pathways to Grad School Workshop	The National GEM Consortium	Workshop informing undergrads about the many paths to a PhD
2015	How to use Solidworks	Pierce College Tutoring Center	Workshop on how to use Solidworks
2013-2014	Being a Great Tutor Workshop	Pierce College Tutoring Center	Workshop on how to be an exceptional tutor
2012	How to Code Workshop	Pierce College Tutoring Center	Workshop on coding

Academic Hiring Committee Experience (Faculty and Administration)

Dates	Campus Department	Participation
June 2020 – Aug 2020	UC Berkeley Grad Div Chief of Staff/ Asst Dean for Diversity	Search Committee Reviewer
Jan 2020 – April 2020	UC Berkeley Mechanical Engineering Dept	Faculty Search Committee
Feb 2018 – April 2018	UC Berkeley Mechanical Engineering Dept	Faculty Search Committee

Teaching Experience

Dates	Organization	Grade Level	Position/Role
Aug 2021 – Dec 2021	UC Berkeley: Antiracism in Tech.	Grad	Graduate Student Instructor
Feb 2021 – June 2021	UC Berkeley: Social Justice in EECS	UG/Grad	Graduate Student Instructor
Aug 2018 – Present	BAS Program	Middle School	Scientist Guest Lecturer
Aug 2018 – Present	BASIS Program	Elementary	Volunteer Group Teacher
June 2012 – June 2014	LAPC Math Department	UGrad	Statistics TA
June 2011 – June 2014	LAPC Tutoring Center	UGrad	Physic/Math/Chem/English/CS Tutor

Relevant Work Experience

Dates	Employer	Field/Area	Position/Title
June 2018 – Aug 2018	Brookhaven National Laboratories	Materials Synthesis	PhD Research Fellow
Aug 2017 – June 2018	The Hospital for Sick Children	Surgical Robotics	Research Fellow
July 2016 – Oct 2016	Perfect Lens LLC	Surgical Optics	Mechanical Engineering
July 2016 – Sept 2016	Parker Aerospace Corp	Aircraft Engine Pneumatics	Tech Engineering Intern
June 2012 – June 2014	LAPC Math Department	Statistics	Teaching Assistant
June 2011 – June 2014	LAPC Tutoring Center	Physic/Math/Chem/English/CS	Tutor
July 2008 – June 2009	Mitchell Laboratories	Non-Destructive Testing	Ultrasound Technician
June 2006 – Feb 2011	Industrial Framing and Concrete	Construction	Framng Apprentice