

Alexander Alvara

engineer_alvara@berkeley.edu

Working Status: US Citizen

Education

- 2018 – Present** **University of California, Berkeley** **Berkeley CA, USA**
Ph.D. & M.S. Mechanical Engineering
Major: MEMS/Nanoscale Science and Engineering
Minors: Education, Materials Science, Physics, Mathematics, Machine Learning
Co-Advisors: Prof. Liwei Lin, PhD (Mech. Engr.) and Prof. Kristofer Pister, PhD (Elec. Engr.)
PhD Coursework: **Completed 05/15/2020**
Preliminary Exam: **Completed 01/16/2019**
- 2017 – 2018** **University of Toronto (one-year study abroad)** **Toronto ON, CAN**
U.S. Fulbright Student Fellowship
Non-Competitive Eligibility (NCE) Certification 2018-2019
Advisors: Prof. James Drake, MD (Neuro.) and Prof. Andrew Goldenberg, PhD (Bio. Eng.)
- 2014 – 2017** **University of California, Irvine (UCI)** **Irvine CA, USA**
B.S. Mechanical Engineering, Specialization in Materials and Mechanical Design
Advisor: Prof. David Reinkensmeyer, PhD (Mech. Engr.)
B.S. Aerospace Engineering, Specializations in Flow Physics and Propulsion Systems
Advisor: Prof. Robert Liebeck, PhD (Aero. Engr.)
B.S. Materials Science and Engineering
Advisors: Prof. Michelle Khine, PhD (Biomed. Engr.) and Prof. Chris Hoo, PhD (Mat. Sci.)
- 2011 – 2014** **Los Angeles Pierce College (LAPC)** **Woodland Hills CA, USA**
A.S. Pre-Engineering
A.S. Mathematics
A.A. Humanities
A.A. Social & Behavioral Sciences
A.A. Science, Technology, Engineering, and Math
Advisors: Prof. Lee Loveridge, PhD (Phys.) and Prof. Elizabeth Cheung, MS (Ind. Engr.)

Current Research Projects

Berkeley Autonomous Microsystems Laboratory (BAMLAB): **PhD Research Fellow** Dec 2019 – Present

Research Topics:

- 1) 4- and 3-bar linkage actuator design, manufacture, and integration into Self-Righting microrobot;
- 2) MEMS actuated control surfaces and airfoils for pencil-sized rockets and fixed-wing exploration;
- 3) Small solar sail arrays for deep space exploration and near-earth orbit object identification;
- 4) Walking micro-robot flexural components, leg design, and integration;
- 5) Microscale friction characterization of on-chip devices

Liwei Lin Laboratory: **PhD Research Fellow** Aug 2018 – Present

Research Topic: Design of Robust Underwater Bio-Inspired Thin Film Piezo Actuators

Fellowships, Scholarships, and Grants

- ✓ 2020 **Global Young Scientists Summit (GYSS) 2021**
- ✓ 2020 **Berkeley Diversity & Community Fellowship**
- ✓ 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**

Patent(s)

- ✓ 2020 **Patent No. 62/833,549: Endoscopic Multi-Tool**

Journal Publications and Conference Papers

- J1. 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 Journal of Medical Devices 2020
- J2. [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
- J3. 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
- J4. [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
- J5. [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 Presentations

- T1. [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
- T2. [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
- T3. 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
- T4. [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
- T5. [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
- T6. [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.
- 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". Cornell University LSAMP and McNair Symposium 2015. Ithaca NY.
- T8. [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

Conference Posters

- C1. [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
- C2. [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.
- C3. [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
- C4. [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
- C5. [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
- C6. [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
- C7. 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
- C8. [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

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

Leadership Experience

Dates	Employer/Organization/Campus Dept	Team Size	Position/Title
Feb 2020 – Present	Graduate Association of Latinx Students	5	Internal Relations Chair
June 2020 – Present	Bias Busters	6	Co-President
Aug 2019 - Present	SACNAS at Berkeley	8	President
June 2019 – Present	LAGSES UC Berkeley	10	Social Co-Chair
Oct 2018 – Present	Bay Area GPS	15	Peer Mentor Chair
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

Teaching Experience

Dates	Organization	Grade Level	Position/Role
Aug 2018 – Present	BAS Program	Middle School	Scientist Guest Lecturer
Aug 2018 – Present	BASIS Program	Elementary School	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

Invited Speaker: Research, Academia, and Scholarship

Date	Role	Event Name	Organization
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	Event to inform Black, Latinx, Native, Asian, and LGBTQ+ about the 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

Review Committee Experience (Publications, Awards, Research)

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

Academic Hiring 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

Community Engagement and Academic Development

Dates	Organization	Grade Level	Current Role
Feb 2020 – Present	Bias Busters at Berkeley	Grad	Co-President
Dec 2019 – Present	Graduate Association of Latinx Students (GALS)	Grad	Internal Relations Chair
Aug 2019 – Present	SACNAS at Berkeley	Grad	President
June 2019 – Present	LAGSES at Berkeley	Grad	Social Co-Chair
Oct 2018 – Present	Bay Area Graduate Pathways to STEM (BA-GPS)	UGrad	Peer Mentor Chair
Aug 2018 – Present	Mech. Eng. Graduate Student Council (MEGSCo)	Grad	Mentor
Aug 2018 – Present	Bay Area Scientists in Schools (BASIS) Program	4 th Grade	Scientist Guest Lecturer
Aug 2018 – Present	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

Academic Events Coordinated

Date	Event Name	Organization	Description
2020-2021	Bay Area SACNAS Grad App Workshop: Bio Edition!	SACNAS @UCSF, @UCBerkeley, @Stanford	Annual one day conference for URM/first gen students about grad school
2020-2021	Fellowship Writing Workshop	SACNAS @UCBerkeley	Annual event on what fellowships there are and how to get them
2019-2020	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 how to identify and deal with implicit biases.
2019-2020	Fellowship Seminar	SACNAS at Cal	Annual event on what fellowships there are and how to get them
2019-2020	Demystifying the Postdoc	SACNAS at Cal	Annual event on what a postdoc is and if it is right for the individual
2019-2020	REU Info Talks	SACNAS at Cal	Event to inform undergrads about REU options at Cal and other institutions
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 above average tutor within a short time (includes ethics)
2012	How to Code Workshop	Pierce College Tutoring Center	Workshop informing first year community college students on coding

Faculty/Academic Preparation Programs

2020	Ford Foundation Conference 2020 - Future Diversity in Faculty "Reclaiming Knowledge for an Equitable Future"
2019	NextProf Pathfinder: Faculty Preparation Program "The Next Generation of Engineering Leaders in Academia"
2019	Ford Foundation Conference 2019 - Future Diversity in Faculty "Empowered Scholarship: Engaging with the World, Connecting with Each Other"

Awards and Honors

2018	LAGSES "Community Builder" Award
2018	Hamlyn Symposium for Medical Robotics, Robot Challenge Award: Best Robotic Design
2016	SHPE UCI "Most Academic Member" Award
2015	SAGE Leadership Fellow
2014	Ana G. Mendez University Systems (AGMUS) Award for Best Undergraduate Poster
2014	LAPC Tutoring Center "Jack Of All Trades" Award