Andy L. Garcia

(786) 575-8285 | Andy.Garcia@columbia.edu | LinkedIn
15 W 100th Street, Apt. 2N, New York, NY 10025

EDUCATION

Columbia University, Fu Foundation School of Engineering and Applied Science *Expected May 2026*
Ph.D. in Biomedical Engineering
Cumulative GPA (4.33): 4.11 Major GPA (4.33): 4.11

Columbia University, Fu Foundation School of Engineering and Applied Science *Dec. 2021*
M.S. in Biomedical Engineering
Cumulative GPA (4.33): 3.84 Major GPA (4.33): 3.88

New York University, Tandon School of Engineering, Brooklyn, NY *May 2020*
B.S. in Mechanical Engineering, Minors in Biomechanical & BioSystems Engineering and Spanish
Cumulative GPA (4.00): 3.40 Major GPA (4.00): 3.63
University Honors Scholar

RESEARCH EXPERIENCE

Graduate Research Assistant *Jan. 2021 – Present*
Cellular Engineering (Hung) Laboratory, Dept. of Biomedical Engineering & Dept. of Orthopedic Surgery
Columbia University, Fu Foundation School of Engineering and Applied Science, New York, NY

- Investigate the chemical and physical effects on cells and tissues of the knee to direct tissue engineering and regenerative medicine efforts to combat osteoarthritis.
- Employ cell culture techniques to grow tissue-engineered cartilage constructs in vitro; utilize biochemical and immunohistochemistry assays and perform mechanical testing to evaluate the quality of constructs and their response to inflammatory insults and novel treatments.
- Research culminated in 2 peer-reviewed conference proceedings.

Undergraduate Research Assistant *Nov. 2019 – Mar. 2020*
Biomechanics, Mechanobiology & Regenerative Medicine (Castillo) Laboratory, Dept. of Orthopedic Surgery
New York University, Grossman School of Medicine, New York, NY

- Analyzed Micro-CT images of long bone defects in tibia of mice utilizing CTAn and Amira software to determine volumes of interest to study the effect of CXCL12 on osteogenesis and angiogenesis.
- Performed aseptic survival surgery on rodent subjects to create critically sized mono-cortical defects in tibia, performed femoral osteotomy, administered inhalation anaesthesia and analgesia via subcutaneous injection.

Undergraduate Research Assistant *Oct. 2018 – Aug. 2019*
Dynamical Systems Laboratory, Dept. of Mechanical Engineering
New York University, Tandon School of Engineering, Brooklyn, NY

- Created NSF-funded belt that converts camera-based sensory signal to vibrations using piezo-based actuators to aid visually impaired navigate unfamiliar surroundings.
- Prototyped actuator concepts, designed experiments, and collected and analyzed large data sets using MATLAB programming language to diagnose issues and meet requirements for functionality.

- Designed & fabricated printed circuit boards (PCBs) on EAGLE, utilizing high-voltage amplifiers and serial peripheral interface (SPI) communication on Arduino microcontroller.
- Research culminated in 1 full-length peer reviewed article, 1 abstract, and 2 podium talks; trained and mentored one undergraduate student.

PROJECTS

Technology Development Intern *Jan. 2021 – Apr. 2021*
OnXPansion: Automated, Targeted Expansion of Patient Tumor Samples
Columbia University, New York, NY

- Developed plan for market readiness for promising tissue engineering technology to catalyze its transition out of the lab, wrote a pitch to best position the company for partnership and investment, securing $90,000 initial investment.
- Interviewed stakeholders to validate the unmet clinical need, evaluated market opportunity, IP landscape, and potential regulatory and reimbursement pathways.
- Exposed to technical, economic, social, and public policy issues involved in the commercialization of medical technologies.

Head of Research and Development *Jan. 2018 – May 2020*
MakerBrace: 3D-Printed Orthotics for Low-Income Patients
New York University, Brooklyn, NY

- Directed research and development of custom, 3D-printed orthotics for children with cerebral palsy, vastly improving performance of 6 patients in completion of bi-manual tasks.
- Implemented innovative technological advancements leading a team of 20 students to facilitate the 3D scanning and 3D modeling process using Rhinoceros3D, resulting in a 95% cost reduction for low-income families.
- Research culminated in 7 podium talks.

PROFESSIONAL EXPERIENCE

Master's Program Ambassador *Jan. 2021 – Jan. 2022*
Department of Biomedical Engineering
Columbia University, New York, NY

- Engage with prospective students to discuss student life and opportunities at the University to drive student enrollment and retention.
- Develop, organize, and manage new student mentorship program to improve student satisfaction and productivity while at the University.
- Review and score video interviews of prospective students to evaluate their academic qualifications and fit with the program.

Technical Assistant *Jul. 2018 – May 2020*
MakerSpace Laboratory
New York University, Brooklyn, NY

- Offered prototyping and technical assistance to over 4000 students utilizing various machines and software around the space, such as 3D printers, CNC machines, laser cutters, electronic test equipment, various 3D modeling software, and Arduino.

- Organized trainings and workshops for groups ranging from 5 to 40 students on advanced prototyping techniques, including microfluidic device fabrication and 3D modeling to improve space utilization by biomedical engineering students.

Peer Tutor *Jul. 2017 – Aug. 2018*
Opportunity Programs
New York University, Brooklyn, NY
Course: Engineering Problem Solving and Programming (MATLAB)

- Met with class of students in groups of 1 to 4 on weekly basis to provide support in MATLAB.
- Coordinated with computer science professor to target instruction on weak topics, improving students' performance by one letter grade between midterms and final and received 5/5 reviews from all students.

TEACHING EXPERIENCE

Preceptor, Columbia University Vagelos College of Physicians and Surgeons
Course: Algebra I *Summer 2021*

Lead Recitation Teaching Assistant, NYU Department of General Engineering
Course: Introduction to Engineering and Design *Summer 2017; Fall 2017 – 19; Spring 2018 – 20*

Teaching Assistant, New York University Tandon School of Engineering
Course: Mechanics *Summer 2018*
Course: Computer Science in Engineering (MATLAB) *Summer 2017 – 18*
Course: MATLAB for Engineers *Summer 2017 – 18*

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Boldini A, **Garcia AL**, Sorrentino M, Beheshti M, Ogedegbe O, Fang Y, Porfiri M, Rizzo JR. (2021). An Inconspicuous, Integrated Electronic Travel Aid for Visual Impairment. *ASME Letters in Dynamic Systems and Control*. Advance online publication. doi:10.1115/1.4050186.

PEER-REVIWED CONFERENCE PROCEEDINGS

1. Gangi LR, Kroupa KR, **Garcia AL**, Pellicore MJ, Spack KA, Ateshian GA, Hung CT. (2022). *Toward mimicking collagen arcades in cartilage tissue engineering for improved subchondral interface integration and tissue mechanics*. 2022 Annual Orthopedic Research Society Meeting, Tampa, Florida.

2. **Garcia AL**, Gangi LR, Kroupa KR, Pellicore MJ, Spack KA, Chahine NO, Lu HH, Ateshian GA, Hung CT. (2021). *Mimicking Benninghoff arches in cartilage tissue engineering for improved mechanics.* 10th Annual Musculoskeletal Repair and Regeneration Symposium, Virtual.

3. Boldini A, **Garcia AL**, Sorrentino M, Beheshti M, Ogedegbe O, Fang Y, Porfiri M, Rizzo JR. (2020). *An Inconspicuous, Integrated Electronic Travel Aid for Visual Impairment*. 53rd Annual American Society of Mechanical Engineers Dynamic Systems and Control Conference, Virtual.

RESEARCH POSTER PRESENTATIONS

1. **Garcia AL**, Boldini A, Rizzo JR, Porfiri M. (2019) *Information-Theoretic Investigation of Human Response to a Navigation Assistive Vibrotactile Device for the Visually Impaired*. New York University Summer Research Program, Brooklyn, NY.

2. Floyd RR, Gale VL, **Garcia AL**, Kurti O, Mesdour S, Casazza CG, Perez K, Bill V. (2019) *A Novel Exoskeleton for the Arm in Children with Cerebral Palsy and MACS III-V*. New York University Tandon School of Engineering Research Exposition, Brooklyn, NY.

3. Rizzo JR, **Garcia AL**, Boldini A, Rizzo JR, Porfiri M. (2018) *A solution to inaccessible urban spaces for the visually impaired: VIS4ION Belt.* National Science Foundation/City University of New York Workshop on Smart and Accessible Transportation–Research Integration and Community Engagement (SAT-RICE), New York, NY.

4. Floyd RR, Gale VL, **Garcia AL**, Kurti O, Mesdour S, Casazza CG, Perez K, Bill V. (2018) *3D-Printing Low-Cost Medical Devices.* Vertically Integrated Projects Mid-Atlantic Conference, Brooklyn, NY.

5. Floyd RR, Gale VL, **Garcia AL**, Zhao S, Bill V. (2018) *3D-Printing Low-Cost Medical Devices*. Vertically Integrated Projects Mid-Atlantic Conference, Newark, DE.

6. Chatterjee I, Floyd RR, Gale VL, **Garcia AL**, Zhao S, Bill V. (2018) *A Novel Exoskeleton for the Arm in Children with Cerebral Palsy and MACS III-V*. New York University Tandon School of Engineering Research Exposition, Brooklyn, NY.

INVITED ORAL PRESENTATIONS

Columbia University Irving Medical Center, Clinical Innovation Laboratory, "Pediatric Remote Otoscopy: Innovation and Clinical Opportunities," New York, NY, October 2021.

Science Spark, USA Science and Engineering Festival, “MakerBrace: 3D Printed Orthotics,” Washington, DC, *April 2020* [Cancelled due to COVID-19]

South by Southwest (SXSW), SXSW Innovation Awards, “MakerBrace: 3D Printed Orthotics,” Austin, TX, *March 2020* [Cancelled due to COVID-19]

New York City Media Lab, Annual Summit Demonstration Exposition, “A Novel Exoskeleton for the Arm in Children with Cerebral Palsy and MACS III-V,” Brooklyn, NY, *September 2019*

National Science Foundation/ City University of New York, Workshop on Smart and Accessible Transportation–Research Integration and Community Engagement (SAT-RICE), “Low-Vision Aware Urban Planning,” New York, NY, *December 2018*

SKILLS

Software: MATLAB, Arduino, R, Amira, CTAn, ImageJ, Microsoft Office, Google Suite, Adobe Illustrator

Wet Laboratory:	Cell Culture, Mechanical Testing, Microscopy, Immunohistochemistry, Biochemistry, Histology
3D Modeling:	Rhinoceros3D; SolidWorks; Autodesk: Fusion360, Eagle, Inventor
3D Printing:	FDM, SLA, PolyJet, SLS
Other:	Soldering, Laser Cutting, CNC Milling
Languages:	English: Native; Spanish: Full Professional Proficiency

FUNDING, HONORS & AWARDS

Garcia AL. (2022) National Science Foundation Graduate Research Fellowship Program, National Science Foundation (NSF), **Fellowship Awardee ($138,000).**

Garcia AL, Gangi LR, Kroupa KR, Pellicore MJ, Spack KA, Chahine NO, Lu HH, Ateshian GA, Hung CT. (2021). Mimicking Benninghoff arches in cartilage tissue engineering for improved mechanics, 10th Annual Musculoskeletal Repair and Regeneration Symposium, **Young Investigator Award in Basic Science.**

Boldini A, Ibrahim J, Segura SC, Vohra S, Shi A, Shaka N, Chaudhry SS, Beheshti M, Pria F, Karakaya M, De Los Santos J, **Garcia AL**, Porfiri M, Rizzo JR. (2021) *Sixth Sense: Safe Autonomous Mobility for the Visually Impaired*, International Vertically Integrated Projects Consortium Innovation Competition, **Second Place.**

Garcia AL, Hung CT, Ateshian GA. (2021) "Laser Treatment Modality for Strengthening Osteoarthritic Cartilage," Research Supplement to Promote Diversity in Health-Related Research for NIH R01 AR073289, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) & National Institute of Health (NIH), **Grant Awardee ($51,342).**

Garcia AL. (2021) Summer Master's Research Fellowship, Columbia University Fu Foundation School of Engineering and Applied Science, **Fellowship Awardee ($5,000).**

Garcia AL, Gale VL, Floyd RR, Bill V. (2020) *The MakerBrace: 3D Printed Orthotics*, South by Southwest (SXSW) Innovation Awards, Austin, TX, **Finalist: Student Innovation [Cancelled due to COVID-19].**

Garcia AL, Casazza CG, Kurti O, Mesdour S, Bill V. (2019) *A Novel Exoskeleton for the Arm in Children with Cerebral Palsy and MACS III-V*, New York City Media Lab Annual Summit, Brooklyn, NY, **First Prize Overall ($4,000).**

Floyd RR, Gale VL, Perez K, **Garcia AL**, Bill V. (2019) *A Novel Exoskeleton for the Arm in Children with Cerebral Palsy and MACS III-V*, New York University Tandon School of Engineering Research Exposition, Brooklyn, NY, **Most Innovative Idea ($1000).**

Garcia AL, Porfiri M. (2019) "Causal Relationships Underlying the Collective Dynamic Behavior of Swarms," National Science Foundation Research Experience for Undergraduates for NSF Award 1433670, National Science Foundation (NSF), New York University Tandon School of Engineering, **Fellowship Awardee ($16,000).**

Floyd RR, **Garcia AL**. (2018) "MakerBrace", Vertically Integrated Projects Mid-Atlantic Conference, Brooklyn, NY, **Most Entrepreneurial Idea ($1,000).**

Floyd RR, **Garcia AL**, Gale VL, Zhao S, Bill V. (2018) "3D-Printed Biomedical Devices", Vertically Integrated Projects Mid-Atlantic Conference, Brooklyn, NY, **Best Leadership ($1,000).**

NIH/NIAMS Diversity Supplement Scholar	2021 – 2022
Hispanic Scholarship Fund Scholar ($5000)	*2020 – 2022*
National Action Council for Minorities in Engineering (NACME) Merit Scholar ($2,500)	*2016 – 2020*
NYU Tandon School of Engineering Merit Scholar ($10,000)	*2016 – 2020*
NYU Tandon School of Engineering Dean's List	*2016 – 2017*

PROFESSIONAL MEMBERSHIPS

Orthopedic Research Society (ORS), Member	*Since Dec. 2021*
American Society of Mechanical Engineers (ASME), Member	*Since Aug. 2018*
Head of Operations; NYU Chapter	*Aug. 2019 – May 2020*
Society of Hispanic Professional Engineers (SHPE), Member	*Since Sep. 2017*