

---

# CURRICULUM VITAE

---

## Paul D. Gordon, PhD

### CURRENT POSITION

Assistant Professor Educator  
Co-Director – Medical Device Innovation Program  
Department of Biomedical Engineering  
University of Cincinnati

### ADDRESS WORK

CEAS - Biomedical Engineering  
Mantei 501  
2901 Woodside Dr.  
Cincinnati, OH 45221-0048  
Email: gordonpd@ucmail.uc.edu

ORCID PROFILE: <https://orcid.org/0000-0003-1673-1222>

LINKEDIN PAGE: <https://www.linkedin.com/in/paulgordonbme/>

---

## EDUCATION

---

- 2021            **Texas A&M University**, College Station, Texas  
*Ph.D. in Biomedical Engineering*  
Dissertation: *Portable multimodal microscopy for quantitative malaria diagnosis and monitoring at the point-of-care*  
Advisor: Dr. Gerard Coté
- 2015            **University of Cincinnati**, Cincinnati, Ohio  
*B.S. in Biomedical Engineering*

---

## RESEARCH EXPERIENCE

---

### RESEARCH FUNDING / SUPPORT:

National Science Foundation – Graduate Research Fellowship; Award no. 2017240275; Funder ID  
<https://doi.org/10.13039/100000001>

### RESEARCH OVERVIEW:

- 2021            **Postdoctoral Researcher**  
Texas A&M Engineering Experiment Station
- Site coordinator for multimillion dollar Department of Defense study
    - Aligned efforts of on-site study participants and stakeholders including engineering and data processing teams, clinical trial coordinators, graduate student researchers, and administrators.
    - Sourced and purchased over \$200,000 in study supplies.
    - Wrote and acquired IRB approval for all on-site study activities involving human-subjects research.
- 2016 – 2021    **Graduate Research Assistant**  
Department of Biomedical Engineering: Texas A&M University  
Optical Bio-Sensing Lab

- Dissertation Research: Portable multimodal microscopy for quantitative malaria diagnosis and monitoring at the point-of-care. Design and construction of low-cost optical system designed to assess the severity of infection at the point-of-care for patients diagnosed with malaria using off-the-shelf optical and electronic components. System is designed to be portable and robust, for use in areas where access to centralized laboratories is limited. Resulted in significant progress of project direction; from cellphone based general detection device to high-fidelity prototype system created for parasitemia quantification and potential utility to combat spreading drug resistance. Spin-off studies investigating hematocrit measurement techniques using microfluidic cartridges and development of rigorous parasitemia detection and sampling statistical model using MATLAB. Resulted in multiple refereed conference proceedings, several journal publications, and technologies for patent disclosure. Additional results include proceedings and papers on microfluidic smear generation and sample staining processes & quality. Skills include statistical modeling, Zemax raytracing, optical system design and testing, immunohistochemical staining techniques, microfluidic device fabrication, computational image processing, and training and integration of deep learning and neural networks.
- Conceptualize, test, and validate method to rapidly prototype parabolic polymer lenses using a low-cost, benchtop centrifuge system. Polymeric lenses can be made with infinitely variable curvatures in either meniscus, positive concave, or negative concave geometries using a variety of materials. Serve as direct supervisor and study co-author of my undergraduate mentee. Resulted in co-authorship of journal publication, peer-refereed conference proceeding, and patent disclosure. Skills include interferometric optical quality assessment and thin-film polymer, self-assembled-monolayer (SAM), and metal layer deposition techniques.

#### PATHS-UP Engineering Research Center

- Troubleshooting, optical modeling, and design modifications for wearable fluorescence-lifetime-based reader of sub-dermal glucose monitoring implant. Successful identification of optical coupling deficiencies and proposed modifications allowed for fabrication of units for use in clinical animal trials.
- Perform design and testing of optical coupling and microfluidic sample access for Aluminum-Nitride integrated photonic, chip-based Raman scattering and fluorescence spectroscopy system. Work to develop optical and microfluidic systems to enable initial signal detection from concentration-based Raman reporter and fluorescent recognition assays. Work has resulted in successful signal detection, conference talk and proceeding, and paper prepared for submission to ACS Nano.
- Supervise undergraduate teams working to create optically realistic integrated skin, tissue, and blood phantom system for in-vitro testing of PPG, pulse-oximeter, & wearable fitness band testing and development. Work requires extensive group management efforts as well as familiarization with entirely new area of phantom creation. Skills include intimate familiarity with designing customized scattering and absorption profiles in materials as well as all tools used, including integrating spheres, inverse-adding-doubling software, plate-readers, polymer molding, and fluidics management control system.

#### Biomedical Device Laboratory

- Test bed development for novel electrosurgical device development in collaboration with industry partner. Direction of tissue sourcing and explantation, exploratory device functionality testing, and coordination of histological study of cellular mechanisms for vascular tissue sealing.

## PUBLICATIONS:

### I. Peer-Reviewed Journal Articles

1. **Gordon, P.**, Dogbevi, K., De Ville, C., Sacchetti, J., & Coté, G., (2021). A portable brightfield and fluorescence microscope toward automated malarial parasitemia quantification in thin blood smears. *PLOS One*. (Under Review).
2. Dogbevi, Kokou S., **Paul Gordon**, Kimberly L. Branan, Bryan Khai D. Ngo, Kevin B. Kiefer, Susanne U. Mertens-Talcott, Melissa A. Grunlan, and Gerard L. Coté. "Brightfield and fluorescence in-channel staining of thin blood smears generated in a pumpless microfluidic." *Analytical Methods* 13, no. 19 (2021): 2238-2247.
3. Makela, M., **Gordon, P.**, Tu, D., Soliman, C., Cote, G. L., Maitland, K., & Lin, P. T. (2020). Benzene Derivatives Analysis Using Aluminum Nitride Waveguide Raman Sensors. *Analytical Chemistry*. DOI: 10.1021/acs.analchem.0c00809
4. **Gordon, P.**, Venancio, V. P., Mertens-Talcott, S. U., & Coté, G. (2019). Portable bright-field, fluorescence, and cross-polarized microscope toward point-of-care imaging diagnostics. *Journal of Biomedical Optics*, 24(9), 096502.
5. Wattinger, M., **Gordon, P.**, Ghorayshi, M., & Coté, G. (2019). Method and system for the centrifugal fabrication of low cost, polymeric, parabolic lenses. *Optics express*, 27(15), 21405-21419.

### II. Refereed Conference Proceedings / Presentations

1. **Gordon, P.**, Dogbevi, K. S., Kiefer, K., Mertens-Talcott, S. U., & Coté, G. (2020, February). Low cost microscope for malarial parasitemia quantification in microfluidically generated blood smears. In *Optics and Biophotonics in Low-Resource Settings VI* (Vol. 11230, p. 1123005). International Society for Optics and Photonics.
2. Branan, K., **Gordon, P.**, Dogbevi, K. S., & Coté, G. L. (2020, February). Thin-film plastics used in microfluidic channels for microscopy imaging in low resource settings. In *Optics and Biophotonics in Low-Resource Settings VI* (Vol. 11230, p. 112300M). International Society for Optics and Photonics.
3. **Gordon, P.**, Ghorayshi, M., Venancio, V. P., Mertens-Talcott, S. U., & Coté, G. (2019, March). Diagnostic utility of a portable multimodal microscope for malaria treatment at the point-of-care. In *Optics and Biophotonics in Low-Resource Settings V* (Vol. 10869, p. 108690X). International Society for Optics and Photonics.
4. Lin, P. T., Cote, G., Maitland, K., Jin, T., Zhou, J., **Gordon, P.**, & Soliman, C. (2019, March). Optical waveguides for on-chip fluorescence measurements (Conference Presentation). In *Optical Diagnostics and Sensing XIX: Toward Point-of-Care Diagnostics* (Vol. 10885, p. 108850K). International Society for Optics and Photonics.
5. Wattinger, M., **Gordon, P.**, & Coté, G. (2019, March). Centrifugal fabrication of low-cost aspheres for point-of-care optical systems. In *Optics and Biophotonics in Low-Resource Settings V* (Vol. 10869, p. 1086905). International Society for Optics and Photonics.
6. **Gordon, P.**, Wattinger, R., Lewis, C., Venancio, V. P., Mertens-Talcott, S. U., & Coté, G. (2018, February). A portable microscopy system for fluorescence, polarized, and brightfield imaging. In *Optics and Biophotonics in Low-Resource Settings IV* (Vol. 10485, p. 104850N). International Society for Optics and Photonics.

### III. Poster & Competition Presentations

1. **Paul Gordon**, Kokou Serge Dogbevi, Vinicius Paula Venancio, Masih Ghorayshi, Susanne U. Mertens-Talcott, Gerard Coté. Portable Multimodal Microscopy for Malaria Screening at the Point-of-Care. Poster Presentation – Texas A&M Biomedical Engineering Annual Research Symposium; August 2018.
2. **Paul Gordon**, Vinicius Paula Venancio, Masih Ghorayshi, Susanne U. Mertens-Talcott, Gerard Coté. Portable Multimodal Microscopy for Malaria Screening at the Point-of-Care. Poster Presentation – Gordon Conference, Lasers in Biology & Medicine; July 2018.

3. **Paul Gordon**, Rolla Wattinger, Cody Lewis, Gerard Cote. A Portable Microscopy System for Fluorescence, Polarized, and Brightfield Imaging. Poster Presentation – Texas A&M Biomedical Engineering Annual Research Symposium; August 2017.
4. **Paul Gordon**, Marie Hopkins, Kathe Pocker. Extending Zeolite Lifespan in Low-Resource Oxygen Concentrators. Research Capstone Presentation – Rice 360° Global Health Design Competition; March 2015.

IV. Other Written Works

1. **Gordon, P**, Byju, A, Criscione, J. (2020). N95 Alternative Masks from HVAC Air Filters. *Video and reference instructions published online during COVID-19 mask shortage crisis.* (27<sup>th</sup> March, 2019). Over 2,900 downloads within 3 weeks of publication.

---

## PROFESSIONAL EXPERIENCE

---

### INDUSTRIAL WORK EXPERIENCE:

2017 – 2019      **DexNeo, Inc**, College Station, Texas

*Engineering Consultant*

- Designed and prototyped complex optical-tissue coupling systems for dual-wavelength laser polarimetry system
- Used CAD & 3D Printing to design and prototype custom optomechanical mounts for novel sensing platform
- Troubleshooting and management of control and sensing electronic systems to drive novel sensing platform

2014              **Kaleidoscope Animations, Inc**, Cincinnati, Ohio

*Engineering Consultant*

- Utilized CAD & 3D Printing to construct and test high-fidelity, functional prototype surgical devices;
- Surgical device prototypes enabled human-stage clinical trial research for major pharmaceutical manufacturing client

2014              **Kaleidoscope Animations, Inc.**

*Full-time Engineering Co-op*

- Developed concepts utilizing Solidworks modeling, rapid prototyping, and high-fidelity manufacturing processes; *inventor of multiple devices on two patent applications*
- Brainstormed and designed complex prototypes of surgical devices and consumer electronics
- Evaluated human factors and usability limitations to current surgical procedures and developed effective solutions
- Completed projects and deliverable documentation for clients on tight, non-flexible deadlines
- Performed in depth market analysis in the consumer healthcare space for a major client

2012              **Willow Wood Company**, Mt. Sterling, Ohio

*Full-time Engineering Co-op*

- Designed and manufactured prototype prosthetics using Solidworks, FEA, metalworking, molding, and 3D printing
- Conducted materials property testing via ISO certified procedures to support manufacturing
- Built test fixtures and automation control to replicate complex product failure modes in self-designed test

- Designed and tested DuraWalk ® K2 foot within short timetable on multi-disciplinary team. Now a successful product.

## **PATENTS:**

- I. Clem, Michael F., Benjamin L. Ko, Robert H. Roth, Daniel J. Abbott, Thomas E. Meyer, and Paul D. Gordon. "Sub-retinal tangential needle catheter guide and introducer." U.S. Patent 10,821,021, issued November 3, 2020.
- II. Ko, Benjamin L., Robert H. Roth, Thomas E. Meyer, Paul D. Gordon, Isaac J. Khan, Daniel W. Price, and Brendan J. Oberkircher. "Therapeutic agent delivery device with advanceable cannula and needle." U.S. Patent 10,219,936, issued March 5, 2019.

## **TEACHING EXPERIENCE**

### **INSTRUCTIONAL EXPERIENCE**

#### Department of Biomedical Engineering, University of Cincinnati

2021 Fall      **BME 5001 – Medical Device Design Sr. Capstone**

*Instructor of Record*

Two sections – 52 Students

- 6 credit-hour, senior level required course during which student teams undergo immersive medical device innovation process from user needs ideation through device testing and validation.

#### Department of Biomedical Engineering, Texas A&M University

2020 Spring      **BMEN 420 – Medical Imaging**

*Instructor of Record*

Two sections – 153 students

- 3 credit-hour, junior level required course with emphasis on applied signals and systems for medical imaging applications. Topics covered include theory, applications, and design of optical, acoustic, tomographic, and magnetic resonance imaging modalities.

2018 Spring      **BMEN 454 & BMEN 485 – Analysis & Design Project 2**

*Teaching Assistant*

Three sections – 108 students

- 3 credit-hour, senior level course designed for student teams of four members to complete prototyping and testing of solutions to real-world biomedical challenges solicited from various external project sponsors. One-hundred students completed projects and presented results at engineering project showcase.

2017 Fall      **BMEN 453 – Analysis & Design Project 1**

*Teaching Assistant*

Two sections – 100 students

- 3 credit-hour, senior level course designed for student teams of four members to review device creation pathways, ideate problem solving concepts, and design & engineer solutions to real-world biomedical challenges solicited from various external project sponsors.

#### **PROFESSIONAL DEVELOPMENT AND TEACHING ENHANCEMENTS:**

2020	College of Engineering Graduate Teaching Fellowship Program
2019 – 2020	Academy of Future Faculty – Texas A&M Center for Integration of Research, Teaching, & Learning
2019	An Introduction to Evidence-Based STEM Teaching, MOOC – Texas A&M CIRTLL
2019	ASEE Annual Conference – Tampa, FL

#### **HONORS & AWARDS:**

2019 – 2020	Graduate Teaching Fellow from Texas A&M College of Engineering
-------------	--

---

### **SERVICE & PROFESSIONAL DEVELOPMENT**

#### **ACADEMIC SERVICE ACTIVITIES:**

2019 – 2020	Aggie Challenge Research Team Supervisor / Mentor
2019 – 2020	Vice President of SPIE Student Chapter – Texas A&M University
2019	Coordinated & led optics & research demonstrations for prospective students at Night @ the Zach
2018 – 2019	President of SPIE Student Chapter – Texas A&M University
2017 – 2019	Communications & Recruitment Liaison for incoming graduate students
2017 – 2019	Coordinated & led optics & research demonstrations for prospective students at Aggieland Saturdays
2017 – 2018	Volunteer Teaching Assistant for Biomedical Sr. Capstone Course – TX A&M Dept. of Biomed. Eng.
2017 – 2018	President of Student Leadership Council – PATHS-UP Engineering Research Center
2017 – 2018	NSF-GRFP Panelist & Application Reviewer for new applicants – Texas A&M Univ.
2017 – 2018	Outreach Coordinator of SPIE Student Chapter – Texas A&M University
2017	Organization Committee for Annual Research Symposium – TX A&M Dept. of Biomed Eng.

#### **SEMINARS & PRESENTATIONS:**

January 2021	ECEN 681 Bioseminar: Presented doctoral research work to Electrical Engineering seminar
January 2021	Virtual presentation of research background context to inform neural network development course. Provided labelled image sets from malaria smear quantification research to enable computational image processing classwork.

#### **PUBLIC SERVICE ACTIVITIES:**

2016 – 2020	<ul style="list-style-type: none"> <li>• Public Science &amp; Optics Education – SPIE Student Chapter, Texas A&amp;M University; <ul style="list-style-type: none"> <li>▪ BioPhysics Saturdays</li> <li>▪ Physics &amp; Engineering Festival</li> <li>▪ Local public-school science fairs (over 12)</li> </ul> </li> </ul>
2019	<ul style="list-style-type: none"> <li>• Community Outreach – Research presentation to local nursing home residents</li> </ul>

- 2013 • Biomedical Service in Guatemala – emphasis on sustainability, effective service, and working across cultural barriers. Conducted survey of rural clinics and hospitals to assess major BME needs. Repaired myriad medical instruments with limited supplies and no budget. Enabled completion of 50+ surgeries in less than two months
- 2011 – 2015 • Bearcat Buddies – tutored Cincinnati Public School students over 100 hours

#### **UNDERGRADUATE STUDENTS MENTORED / SUPERVISED:**

##### Texas A&M University:

- 2020 Anneliese Kagerer – Aggie Challenge / PATHS-UP VIP Team
- 2020 Alyssa Kunkel – Aggie Challenge / PATHS-UP VIP Team
- 2020 Courtney Lowell – Aggie Challenge / PATHS-UP VIP Team
- 2020 Sam Mathew – Aggie Challenge / PATHS-UP VIP Team
- 2020 Jacob Rodriguez – Aggie Challenge / PATHS-UP VIP Team
- 2020 Jeremy Thomas – Aggie Challenge / PATHS-UP VIP Team
- 2020 Rashika Tomar – Aggie Challenge / PATHS-UP VIP Team
- 2019 – 2020 Minh Tam Nguyen – Aggie Challenge / PATHS-UP VIP Team
- 2019 – 2020 Michael Entrop – Aggie Challenge / PATHS-UP VIP Team
- 2019 Michael Rhiew – Aggie Challenge / PATHS-UP VIP Team
- 2019 Harsha Siripurapu – Aggie Challenge / PATHS-UP VIP Team
- 2019 Brittany Tran – Aggie Challenge / PATHS-UP VIP Team
- 2019 Madelynn Gomez – Aggie Challenge / PATHS-UP VIP Team
- 2019 Juan Rodriguez – Undergraduate Researcher / REU
- 2019 Carla Bassil – Aggie Challenge / PATHS-UP VIP Team
- 2019 Wahibah Hannan – Aggie Challenge / PATHS-UP VIP Team
- 2019 Mazen Ali – Aggie Challenge / PATHS-UP VIP Team
- 2019 Cassandra Jane – Aggie Challenge / PATHS-UP VIP Team
- 2019 Kimberley Branan – Undergraduate Researcher
- 2019 – 2019 Amanda Gibbens – Undergraduate Researcher
- 2018 – 2019 Ibukunoluwa Falana – Undergraduate Researcher
- 2017 – 2019 Masih Ghorayshi – Undergraduate Researcher
- 2016 – 2019 Rolla McCrae Wattinger – Undergraduate Researcher

#### **PROFESSIONAL SOCIETIES:**

- 2016 – present Member – SPIE, The International Society for Optics & Photonics
- 2019 – present Member – ASEE, American Society for Engineering Education
- 2019 – present Member – BMES, Biomedical Engineering Society
- 2019 – present Member – IEEE, Institute of Electrical and Electronics Engineers

#### **CERTIFICATES:**

- 2019 CIRTL Associate – Center for the Integration of Research, Teaching and Learning at Texas A&M
- 2015 UC Forward Innovation & Commercialization – University of Cincinnati
- 2015 Cooperative Education – University of Cincinnati

