

# ANDREW N. SIVAPRAKASAM

Lyles-Porter Hall ◊ 715 Clinic Drive ◊ West Lafayette, IN 47907

(304) · 553 · 1317 ◊ asivapr@purdue.edu

[Website](#) | [GitHub](#) | [Twitter](#)

## EDUCATION

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### Indiana University School of Medicine

MD/PhD Candidate

Medical Scientist Training Program (MSTP)

August 2018-Present

Indianapolis, IN

### Purdue University

PhD in Biomedical Engineering

Thesis: *Place and Time Processing of Pitch in the Context of Cochlear Dysfunction*

April 2020-March 2025

West Lafayette, IN

### University of Pittsburgh

B.S.E. in Bioengineering

Minors: Computer Science, Chemistry

Magna Cum Laude

August 2013-April 2018

Pittsburgh, PA

## EXPERIENCE

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### Auditory Neurophysiology and Modeling & SNAP Laboratories

PhD Student— Advisors: Michael Heinz, PhD & Hari Bharadwaj, PhD

May 2019 - March 2025

West Lafayette, IN

- Applying various signal processing and data analysis techniques to investigate normal hearing and hearing disorders using translational and basic science approaches. Interested in pitch perception in sensorineural hearing loss and improving non-invasive assays to isolate the effects of cochlear anatomic impairments (IHC/OHC/cochlear synapse damage) that are undifferentiable using current clinical diagnostics.

### EMG-Based Aid for Dysphagia Rehabilitation

Software Consultant— Lead Inventor: Georgia Malandraki, PhD

September 2021 - May 2022

West Lafayette, IN

- Refining a novel device to improve impaired deglutition after stroke or injury. Providing programming (C<sup>++</sup>) expertise to translate swallowing EMG signal recordings into an intuitive, front-end patient interface.

### Brainstem Neurophysiology Laboratory

Rotation Student — Advisor: Mark Sayles, MD, PhD

July 2018 - August 2018

West Lafayette, IN

- Observed methods used to record single-unit auditory nerve spikes at the Purdue Dept. of Speech, Language, & Hearing Sciences.

### Human Engineering Research Laboratories (HERL)

Research Associate — Advisor: Alicia Koontz, PhD

January 2016 - April 2018

Pittsburgh, PA

- Assisted with study design, data analysis, and programming related to investigating wheelchair propulsion kinetics and kinematics using the Computer-Assisted Rehabilitation Environment (CAREN). Led SBIR Phase I development and testing of the *AgileLife Patient Transfer System*.

### Orthopaedic Biodynamics Laboratory

Research Assistant — Advisor: Scott Tashman, PhD

May 2014 - December 2015

Pittsburgh, PA

- Studied knee joint biomechanics and cartilage morphology after ACL reconstruction using Dynamic Stereo X-ray, MRI, and CT image analysis techniques

## PEER-REVIEWED PUBLICATIONS

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1. S. Hauser, **A. Sivaprakasam**, H. Bharadwaj, M. Heinz, “Precision Diagnostics for Complex Sensorineural Hearing Loss,” Mechanics of Hearing Workshop 2024 (MoH 2024). DOI: [10.5281/zenodo.13334652](https://doi.org/10.5281/zenodo.13334652)
2. A. Farhadi, S. Hauser, **A. Sivaprakasam**, M. Heinz, “Simultaneous Recording of Otoacoustic Emissions and Envelope-Following Responses to Evaluate Efferent Influences on Neural Coding,” Mechanics of Hearing Workshop 2024 (MoH 2024). DOI: [10.5281/zenodo.13329441](https://doi.org/10.5281/zenodo.13329441)
3. F. Deloche, S. Parida, **A. Sivaprakasam**, M. Heinz, “Estimation of Cochlear Frequency Selectivity Using a Convolution Model of Forward-Masked Compound Action Potentials,” Journal of the Association for Research in Otolaryngology (2024). DOI: [10.1007/s10162-023-00922-1](https://doi.org/10.1007/s10162-023-00922-1)
4. **A. Sivaprakasam**, H. Wang, R. Cooper, and A. Koontz, “Innovation in Transfer Assist Technologies for Persons with Severe Disabilities and Their Caregivers,” IEEE Potentials, vol. 36, no. 1, pp. 34-41

## SELECTED CONFERENCE PRESENTATIONS

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### Neural Coding of Pitch and Modulations in Hearing Loss

1. **A. Sivaprakasam**, S. Hauser, M. Heinz, H. Bharadwaj, “Integrating Physiological and Perceptual Assays to Resolve the Effects of Sensorineural Hearing Loss on Neural Place and Time Cues for Pitch.” Association for Research in Otolaryngology 48<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2025.
2. S. Hauser, **A. Sivaprakasam**, H. Bharadwaj, M. Heinz, “Detecting and Disambiguating ‘Hidden’ Cochlear Pathologies: Inner Hair Cell Injury and Cochlear Synaptopathy.” Association for Research in Otolaryngology 48<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2025.
3. S. Hauser, **A. Sivaprakasam**, H. Bharadwaj, M. Heinz, “Physiological Profiling of Sensorineural Hearing Loss for Predicting Speech-in-Noise Outcomes for hearing in noise.” American Auditory Society, Scottsdale, Arizona, 2025.
4. **A. Sivaprakasam**, S. Hauser, H. Bharadwaj, M. Heinz, “Subtypes of Sensorineural Hearing Loss Variably Alter the Neural Encoding of Fundamental Frequency.” Auditory System Gordon Research Conference (GRC). Smithfield, RI, 2024.
5. **A. Sivaprakasam**, H. Bharadwaj, M. Heinz, “Cross-Species Investigations of Place and Time Coding of Pitch Using Envelope-Following Responses.” Association for Research in Otolaryngology 47<sup>th</sup> Annual MidWinter Meeting, Anaheim, CA, 2024.
6. A. Farhadi, S. Hauser, **A. Sivaprakasam**, M. Heinz, “Evaluation of Efferent Influences on Neural Coding Using Pre-Clinical Models of Sensorineural Hearing Loss.” 186th Acoustical Society of America Meeting. Ottawa, ON, 2024.
7. A. Farhadi, M. Patra, **A. Sivaprakasam**, M. Heinz, “Investigating Potential Sources of Modulation Enhancement in Noise through Physiologically Recorded and Model Neural Responses.” Association for Research in Otolaryngology 47<sup>th</sup> Annual MidWinter Meeting, Anaheim, CA, 2024.
8. **A. Sivaprakasam**, I. Schweinzger, H. Bharadwaj, M. Heinz, “Upper-Harmonic Deficits in Temporal Envelope Coding of Tone Complexes and Amplitude Modulations Differentiate Inner Hair Cell Damage From Synaptopathy,” Association for Research in Otolaryngology 46<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2023.
9. **A. Sivaprakasam**, I. Schweinzger, H. Bharadwaj, M. Heinz, “Inner Hair Cell Damage and Cochlear Synaptopathy Differentially Impact Neural Envelope Coding of Modulations and Pitch,” 9<sup>th</sup> Midwest Auditory Research Conference, Ann Arbor, MI, 2022. (Platform)

10. I. Schweininger, **A. Sivaprakasam**, M. Heinz, “Differentiating Inner Hair Cell Dysfunction From Cochlear Synaptopathy Using Non-Invasive Measures of Temporal Envelope Coding in Chinchilla,” Association for Research in Otolaryngology 45<sup>th</sup> Annual MidWinter Meeting, San Jose, CA, 2022.

### Computational Modeling of Neurophysiology & Frequency Selectivity

11. M. Patra, A. Farhadi, **A. Sivaprakasam**, D. Axe, M. Heinz, “Refinement of Inner Hair Cell Dysfunction in a Phenomenological Auditory Nerve Model Using Physiological and Single-Unit Recordings following Selective IHC Dysfunction.” Association for Research in Otolaryngology 47<sup>th</sup> Annual MidWinter Meeting, Anaheim, CA, 2024.
12. M. Patra, **A. Sivaprakasam**, D. Axe, M. Heinz, “Testing Phenomenological Auditory-Nerve Model Predictions for Selective Inner- and Outer-Hair-Cell Dysfunction.” 184<sup>th</sup> Acoustical Society of America Meeting. Chicago, IL, 2023.
13. F. Deloche, **A. Sivaprakasam**, M. Heinz, “Effect of Suppressive Masking on the Dynamic Range of Auditory-Nerve Responses: Characterization With Forward-Masked Compound Action Potentials,” Association for Research in Otolaryngology 46<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2023.
14. F. Deloche, **A. Sivaprakasam**, M. Heinz, “Characterization of Cochlear Compressive Nonlinearities using Forward-Masked Compound Action Potentials,” 19<sup>th</sup> International Symposium on Hearing, Lyon, France, 2022.
15. F. Deloche, S. Parida, **A. Sivaprakasam**, M. Heinz, “Estimation of Cochlear Frequency Selectivity Using a Convolution Model of Forward-Masked Compound Action Potentials,” Association for Research in Otolaryngology 45<sup>th</sup> Annual MidWinter Meeting, San Jose, CA, 2022.
16. **A. Sivaprakasam**, H. Bharadwaj, M. Heinz, “The Role of Envelope and Temporal Fine Structure in Auditory Neural Coding of Timbre in Normal and Impaired Hearing,” Neuroscience 2021, Chicago, IL, 2021.

### Translational Research & Large-Scale Data Analysis

17. M. Heinz, A. Grama, S. Hauser, **A. Sivaprakasam**, H. Bharadwaj, O. Clavier “An Open-Science Cross-Species Data Resource for Standardized Hearing Assessments.” Association for Research in Otolaryngology 48<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2025.
18. A. Hustedt-Mai, J. Alexander, E. Bartlett, A. Grama, M. Shader, J. Simpson, E. Jensen, S. Hauser, **A. Sivaprakasam**, M. Heinz “Accessible Precision Audiology Research Center (APARC) in a Community-based Innovation Districts.” American Auditory Society, Scottsdale, Arizona, 2025.
19. V.M. Athreya, **A. Sivaprakasam**, H. Ginsberg, H. Bharadwaj, M. Heinz, “Pioneering Cortical Assays of Gap Detection to Explore Temporal Processing in Chinchilla using a Multi-Channel Mini-EEG Cap.” Association for Research in Otolaryngology 47<sup>th</sup> Annual MidWinter Meeting, Anaheim, CA, 2024.
20. **A. Sivaprakasam**, S. Hauser, N. Seidl, D. Hake, H. Bharadwaj, M. Heinz, “Towards an Open-Source Precision Audiological Diagnostics Core for Large-Scale Data Analysis.” Virtual Conference on Computational Audiology 2023.
21. **A. Sivaprakasam**, V.M. Athreya, H. Ginsberg, H. Bharadwaj, M. Heinz, “A Chinchilla Mini-EEG Cap Improves Cross-Species Translation for Cortical and Subcortical Evoked Potentials,” Association for Research in Otolaryngology 46<sup>th</sup> Annual MidWinter Meeting, Orlando, FL, 2023.

## Medical Education & Innovation

22. Z. Guckien, A. Woloshuk, N. Patel, **A. Sivaprakasam**, A. Warrick, L. Garcia, “Advancing Innovation in Medicine: Expanding the Physician’s Toolbox” IUSM Education Day, Indianapolis, IN, 2021. *\*Awarded Outstanding Abstract for Poster Presentation\**
23. A. Woloshuk, **A. Sivaprakasam**, N. Patel, A. Warrick, A. Witten, L. Brennan, Z. Guckien, N. Diggins, L. Garcia, L. Wang, J. Acchiardo, J. Merrell, “A Prototype ECG for Neonatal Resuscitation,” IUSM Student Research Symposium, Indianapolis, IN, 2020: <https://youtu.be/thIokzKTyOE>

## Rehabilitation & Orthopaedic Biomechanics (Univ. of Pittsburgh)

24. **A. Sivaprakasam**, S. Bass, D. Kamaraj, and A. Koontz, “Investigating Wheelchair Seating Parameters and Their Effect on Ramp Propulsion,” Biomedical Engineering Society 2017 Annual Meeting, Phoenix, AZ, 2017.
25. **A. Sivaprakasam**, R. Cooper, and A. Koontz, “Evaluation of the AgileLife Patient Transfer and Movement System,” Rehabilitation Engineering and Assistive Technology Society of North America (RESNA) 2017, New Orleans, LA, 2017.
26. **A. Sivaprakasam** and A. Koontz, “The Usability of an Automated Patient Transfer Technology,” 19th Annual NPSF Congress, Orlando, Florida, 2017.
27. **A. Sivaprakasam**, J. Irrgang, F. Fu, and S. Tashman, “Contralateral Limb Differences in Knee Kinetics After Anterior Cruciate Ligament Reconstruction,” Biomedical Engineering Society 2015 Annual Meeting, Tampa, FL, 2015. (Platform)
28. **A. Sivaprakasam**, J. Irrgang, F. Fu, and S. Tashman, “Contralateral Limb Differences in Knee Kinetics and Correlations to Kinematic Differences After Anterior Cruciate Ligament Reconstruction,” University of Pittsburgh Science 2015, Pittsburgh, PA, 2015.
29. E. Thorhauer, K. Sass, **A. Sivaprakasam**, J. Irrgang, F. Fu, and S. Tashman, “Alterations in In Vivo Knee Cartilage Contact After Anterior Cruciate Ligament Reconstruction and Correlations to Clinical Outcomes,” Orthopaedic Research Society 2015 Annual Meeting, Las Vegas, NV, 2015.
30. E. Thorhauer, K. Sass, **A. Sivaprakasam**, J. Irrgang, F. Fu, and S. Tashman, “Changes in Tibiofemoral Gait Kinematics Are Associated with Regional Cartilage Morphological Changes,” Orthopaedic Research Society 2015 Annual Meeting, Las Vegas, NV, 2015.
31. R. OHara-Plotnik, E. Thorhauer, **A. Sivaprakasam**, J. Irrgang, F. Fu, and S. Tashman, “Gait Is a Poor Task Choice for Identifying Kinematic Deficits After ACL Reconstruction ” Orthopaedic Research Society 2015 Annual Meeting, Las Vegas, NV, 2015.

## OTHER TALKS & WORKSHOPS

1. *Envelope Coding Degradation Following IHC Damage: Data vs Model.* **A. Sivaprakasam**, M. Heinz. Auditory Nerve Modeling Session hosted by Laurel Carney at the ARO 46<sup>th</sup> Annual MidWinter Meeting. February 13<sup>th</sup>, 2023.
2. *Put the PRO in Programming.* **A. Sivaprakasam**, N. Patel, A. Petrucciani. Student-led Workshop. IU Medical Scientist Training Program Retreat 2021. July 10<sup>th</sup>, 2021

## GRANTS & FELLOWSHIPS

### **National Institutes of Health**

· *Place and Time Processing of Pitch in the Context of Cochlear Dysfunction.*

Ruth L. Kirschstein Predoctoral MD/PhD Fellowship (1F30DC020916). 01/01/2023-12/31/2025.

Principal Investigator. Award Amount: \$52,694/yr

### **Purdue University**

- Interdisciplinary Training in Auditory Neuroscience (1T32DC016853) Fellowship (2020-2022)

### **Indiana University**

- Haselby Family Scholarship Recipient (2018-2020)

### **University of Pittsburgh**

- Nominated (BioE Dept.) for the 2018 George Washington Prize
- Swanson School of Engineering Summer Research Internship 2017
- Swanson School of Engineering Summer Research Internship 2015

## **AWARDS & ACHIEVEMENTS**

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### **Academic**

- 2023 ARO MidWinter Meeting Travel Award Recipient
- Finalist for University of Pittsburgh *Co-op Student of the Year*

### **Other**

- Honorable Mention in Professional Color Category, Indiana State Fair Photography Competition, 2023
- Top 10 in age group for several long-distance races (5mi - HM). [[Athlinks Profile](#)] [[Garmin Wrapped](#)]

## **TEACHING EXPERIENCE**

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### **Purdue University**

- Guest Lecturer & Teaching Assistant, BME 511 — Biomedical Signal Processing  
Lecture Topics: Linear algebraic approaches, Eigendecomposition, Principal Component Analysis  
[Student Evaluation](#): 4.14 / 5

### **University of Pittsburgh**

- Teaching Assistant, HRS 2774 — Rehabilitation Biomechanics (Fall 2016)
- Teaching Assistant, BIOENG 1310 — Bioinstrumentation (Spring 2016 & 2017)

## **MENTORING EXPERIENCE**

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Fernando Aguilera de Alba, *Behavioral Comparison of Comodulation Masking Release (CMR) Between Chinchillas and Humans*. Summer 2020 (Co-Mentored)

## **EXTRACURRICULAR INVOLVEMENT**

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### **Purdue College of Engineering**

*Student Photographer*

Fall 2022-Present

*West Lafayette, IN*

- Take on as-needed assignments to capture portraits and candid campus sights
- Process photos for social media using Adobe Lightroom and Photoshop
- Work regularly featured on [@purdueengineers](#)

### **Advancing Innovation in Medicine (AIM)**

*Co-Founder*

Spring 2019-Present

*Indianapolis, IN*

- Student Interest Group (SIG) created with the purpose of educating medical students on the medical design process/prototyping
- Taught basic programming and CAD concepts using student-led design project

### **Auditory Neuroscience Association at Purdue (ANAP)**

*President (2021-2022) | Vice President (2020-2021)*

Summer 2020-Present

*West Lafayette, IN*

- Group focused on peer discussion, networking, and mentoring for Purdue undergraduates, graduates, and post-doctoral trainees interested in auditory neuroscience
- Organized monthly talks, discussions, and social events

**IUSM Combined Degree Student Council (CDSC)**

Fall 2018-Present

*Class Representative*

*Indianapolis, IN*

- Convey class concerns and feedback to administration and assist with organizing annual MSTP retreat

**IUSM Symphony Orchestra**

Fall 2018-Fall 2020

*Violinist*

*Indianapolis, IN*

- Perform approximately twice per semester
- Continuing 15 consecutive years as an orchestral musician

**LICENSURE & CERTIFICATION**

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USMLE Step 1 — Pass, June 2020

**TECHNICAL STRENGTHS**

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**Programming Literacy**

Matlab, Java, HTML, Python, Android App Development

**Adobe Creative Cloud**

Lightroom, Illustrator, Photoshop

**Motion Capture & Imaging Tools**

Visual3D, Vicon Nexus, Mimics

**Other Software**

LabView, Solidworks