

# Michael Barkasi, PhD

Bikes // Sensory Perception // Human Motion Control

Résumé

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Toronto | Canada

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## Highlights

- Internationally recognized expert in philosophy and cognitive science on perception and consciousness, work presented around North America and Europe, frequent academic journal referee, 10 major academic papers published.
- Experience translating academic research into industry, establishing academic-industry partnerships, iterative prototyping, and applied research ideation.
- Expert knowledge in advanced mathematics: Geometry (tensors, quaternions, lie groups, modules, fields, and vector spaces), computability theory (Turing machines, Gödel's theorems), and mathematical logic (first-order logic, modal logic, many-valued logic, model theory, set theory).
- Ten years experience as a university instructor, with curriculum design, and technical writing in the university.
- Passionate amateur cyclist with experience in racing, community coaching, and bike service (mechanic); have raced in velodromes in Texas, Pennsylvania, New York, and Ontario.

## Education

2015. **Ph.D. Philosophy.** Rice University.

- Dissertation on perceptual experience which integrated work from philosophy, neuroscience, and cognitive psychology to answer questions about the nature of phenomenal consciousness.
- Completed 3 advanced courses in mathematics focused on algebric geometry and number theory: Algebra II (Math 463), Algebra III (Math 464), and Lie Theory (Math 371).

2013. The 5th Graduate International Summer School in Cognitive Sciences and Semantics (ISSCSS) on Perception, co-organized by the Center for Cognitive Sciences and Semantics at the University of Latvia and the Department of Philosophy at McMaster University and hosted by the University of Latvia. July 19–29.

2012. The 5th North American Summer School in Logic, Language and Information (NASSLLI), organized by the Association for Logic, Language and Information (FoLLI) and hosted by the University of Texas, Austin. June 18–22.

2011. **M.A. Philosophy.** Rice University.

2010. The 22nd European Summer School in Logic, Language and Information (ESSLLI), organized by the Association for Logic, Language and Information (FoLLI) and hosted by the University of Copenhagen. August 9–20.

2010. Carnegie Mellon Summer School in Logic and Formal Epistemology. June 7–25.

2009. **B.A. Philosophy, minors in Maths and Physics.** *Summa Cum Laude.* Kutztown University of Pennsylvania.

- Minors consisted of 16 courses total in mathematics and physics, including a full calculus series, geometry, abstract algebra, introductory and modern physics, mathematical methods in physics, heat and thermodynamics, and quantum mechanics.

## Work Experience

2022.04–Present. **Apprentice Bike Mechanic**

[GEARS Bike Shop](#). ON, Canada

- Assemble, tune, and safety-check mechanical bikes of all levels out-of-box for customer orders.
- Perform extensive tune-ups including stripping bike to the frame with a full rebuild of all mechanical components.
- Assist customers with on-the-spot repairs (e.g. flat tires) and tune-ups (e.g. gear indexing).
- Complete work orders for part replacement (e.g. shifters, brake pads, cables, cable housing, bar tape) and service (e.g. component disassembly, gear indexing, headset and bottom bracket overhauls).
- Maintain industry certifications: S-TEC: Hydraulic Disc Brakes, Di2 Certified Technician, Shimano Pedaling Dynamics, Wheel and Hub, Drivetrain-Road, Drivetrain-Mountain, Drivetrain-STEPS, Retail Operations Service Department.

2018.08–Present. **Volunteer Referee for Academic Journals**

[Multiple Professional Journals](#). Remote

- Invited by editors on an ad hoc basis to evaluate articles submitted to professional philosophy and cognitive science journals as part of the academic peer-review process.
- Assess articles based on the originality of the proposal, their engagement with the relevant academic literature, and the logic of their argument.
- Write timely and thorough explanations for editors outlining the strengths and weaknesses of a paper, along with my recommendation for publication or rejection.
- Reassess articles that have been revised based on my previous comments.
- Have refereed for the following journals: Journal of Philosophy, Australasian Journal of Philosophy, Philosophical Transactions of the Royal Society: Biological Sciences, Mind and Language, Thought, Synthese, Philosophical Quarterly, Dialectica, Philosophical Psychology, Grazer Philosophische Studien, and The Journal of the American Philosophical Association.

2021.08–2022.09. **Founder, Lead Technology Developer**

[Performance Sonification Corp.](#) ON, Canada

- Translated cutting edge academic research on human perception into a tangible product with the aim of adding value to high-performance athletic training.
- Wrote lightweight but accurate motion processing algorithms for raw inertial data that run in real-time in embedded systems at 1000Hz.
- Designed and built innovative wearable sensor systems that convert motion into sound.
- Prototyped iteratively, via CAD modeling, 3D printing, and low-volume PCB production, until device benchmarks are met.
- Established a long-term collaboration with an independent university lab at York University to test the effectiveness of motion-to-sound mappings ("sonifications") at improving motion control in elite athletes.
- Planned a series of experiments to develop and validate a motion sonification product, including passing this project through a university ethics review board (principle author for ethics board submission material).
- Validated new inertial motion processing algorithms against optical motion-capture systems.
- Developed dynamic time-warping algorithms to match motion paths of different velocities in real-time.
- Developed ultra-fast, ultra-low latency digital sound synthesis techniques using nonstandard methods and bare-metal programming.
- Working in/with/on C++, R, KiCad, FreeCAD, PCB design, digital sound synthesis, advanced geometry and motion representations.
- Concluded project in September 2022 after a series of proof-of-concept experiments showed the ultimate development of the tech to commercial product would be too long and costly.

2022.01–2022.04. **Philosophy Lecturer**

[University of British Columbia, Okanagan](#). BC, Canada / Remote

- Teaching 1 course: Philosophy of Psychology (40 students).
- Delivering lectures over Zoom.
- Responsible for all curriculum development and grading.

2020.08–2021.04. **Philosophy and Cognitive Science Instructor**

[York University](#). ON, Canada

- Continued an innovative research program (begun at the University of Toronto as a postdoc researcher) in the philosophy and cognitive science of consciousness.
- Crafted innovative theories of perceptual experience based on the latest neuroscientific work on object tracking, dreams, hallucinations, and memory.
- Wrote and published 4 cognitive science research articles in premier peer-reviewed academic journals, including coordinating coauthored research with two different coauthors on two different projects; one of these papers was a runner-up for the Philosophy of Memory Essay Prize (Centre de Philosophie de la Mémoire).
- Presented research at 4 international peer-reviewed academic conferences.
- Taught 3 courses: Philosophy of Artificial Intelligence (30+ students), Philosophy of Psychology (30+ students), and Minds, Brains, and Machines (100+ students).
- Delivered courses synchronously online over Zoom and asynchronously through a learning management system.
- Designed and produced all aspects of the curriculum from scratch, to meet the learning needs of students.

- Prepared detailed slides and lectures for students, communicating complex ideas in understandable ways.
- Taught humanities writing: thesis selection, project scope, outlining, grammar, organization, drafting, revising.
- Graded batches of 30+ long-form essays and exams (2000+ words) with detailed feedback on short turnarounds (1 week).
- Communicated across disciplinary boundaries, conveying philosophy to scientists and science to philosophers.
- Supported students with advice, mentoring, and letters of recommendation.

2018.07–2020.06. **Postdoctoral Research Fellow at the Network for Sensory Research**

[University of Toronto, Mississauga](#). ON, Canada

- Carried out leading international research on neural representation and consciousness in dreams, hallucinations, memory, and perception.
- Published 4 papers in leading philosophy and cognitive science journals.
- Organized a workshop with leading international and multidisciplinary researchers in philosophy, neuroscience, and engineering (from Canada, the US, Europe, Australia, and Japan).
- Peer-reviewed for leading philosophy and science journals.

2017.04–2018.06. **Youth Cycling Coach**

[Valley Preferred Cycling Center](#). PA, United States

- Coached youth aged 8-16 in spring and fall youth bicycle racing league (BRL).
- Ran indoor cycling classes for youth for the Boys and Girls Club and Allentown Community Bike Works (Gear Up Academy).
- Ran training sessions as needed for the velodrome's youth race team.
- Ran bicycle safety program for youth aged 4-8 (PeeWee Pedalers).
- Ran try-the-track classes for adults learning to ride the velodrome.
- Fit youth riders on track bikes and helped them understand the mechanics of riding a fixed-wheel, single-gear bicycle.
- Provided support to preteen and teenage riders who struggled in racing and helped them develop.

2018.01–2018.05. **Philosophy Instructor**

[Lebanon Valley College](#). PA, United States

- Taught The Examined Life, an introduction to philosophy.
- Delivered lectures on a wide range of philosophical topics: Plato on the good life, Russell on skepticism, Hume on religion, Foot on naturalized ethics, and Butler on gender.
- Prepared all aspects of the curriculum to meet the needs of students.

2016.08–2017.05. **Visiting Assistant Professor of Philosophy**

[Kutztown University of Pennsylvania](#). PA, United States

- Taught philosophy courses (Intro to Philosophy, Ethics, and American Philosophy).
- Prepared related material for students on theories of meaning and truth, the meaning of life, and happiness.

2016.03–2016.07. **Philosophy Instructor**

[Lone Star College, Tomball and University Park](#). TX, United States

- Taught Intro to Philosophy (both in-person and online) to diverse, nontraditional college students.

2015.12–2016.02. **Application Reader**

[Rice University](#), Admissions Department. TX, United States

- Reviewed applications for undergraduate admission.
- Scored applications based on departmental rubrics and guidelines.
- Made informed, holistic judgments of applicants.
- Handled a high load of applications and worked under tight deadlines.

2009.08–2015.05. **Graduate Instructor and Researcher in Philosophy (PhD Student)**

[Rice University](#). TX, United States

- Fully funded (tuition plus stipend, valued at \$45k USD/year), plus \$10k+ in additional competitive funding for research, travel, and an extended stipend.
- Conducted philosophical research in philosophy of perception, presented papers at international conferences, co-organized a reading group, and organized the department's work-in-progress series for students and faculty.

- Refined the philosophy department's graduate-level mathematical logic curriculum, turning rough notes into a polished in-house textbook (200+ pages).
- Applied formal semantics (modal logic) to build a theory of the semantics and pragmatics of epistemic modals (certain uses of words like 'may' and 'might').
- Taught philosophy courses (in both logic and philosophy of mind) as an independent instructor and also worked as a teaching assistant.
- Taught a writing-intensive course in Rice's writing-intensive program for freshman, designed to teach new university students how to write a substantial college research paper.

2012.08–2013.12. **Research Assistant for The Senses Project at Rice**

[Rice University](#). TX, United States

- Co-organized with project director a workshop bringing together leading philosophers of mind.
- Conducted literature reviews, compiled bibliographic databases, and wrote research summaries.

2011.06–2012.05. **Philosophy Instructor**

[Lone Star College, North Harris](#). TX, United States

- Taught Intro to Philosophy and Intro to Ethics to diverse, nontraditional college students.

2011.08–2011.12. **Philosophy Instructor**

[Houston Community College, Katy Campus](#). TX, United States

- Taught Intro to Philosophy and Intro to Logic.