

Yoyo Munk

Curriculum Vitae

740 Olivant Pl
Pittsburgh, USA 15206
☎ (+1) 4154973581
✉ yoyo@yymnk.cc



Summary

I am a scientist and artist whose research explores human engagement with emerging technologies through large-scale installation works, public exhibitions, and critical interface design. My transdisciplinary career has spanned the aerodynamics of gliding ants, visual psychophysics for augmented reality systems, and immersive experiences exhibited at leading international institutions. Across these fields, I have maintained a consistent focus on finding novel perspectives for the understanding of complex systems, from biological systems to technological and social ones.

Experience

2025–Present **Independent Scientist and Artist**, Pittsburgh.

- Inaugural Creative Technologist in Residence at State Library Victoria. Eight-week residency embedded in the newly established SLV Lab, culminating in the successful exhibition of a newly developed work for mixed reality entitled *In Memory / Of Being*.
- Contracted development work on yet-to-be-announced works for Tin Drum.

2017–2025 **Chief Science Officer**, *Tin Drum*, London, Amsterdam, Pittsburgh.

- Principal artist, project director, and lead developer on *Medusa*. Exhibited in 2021 at the V&A Museum as the headlining exhibition of the London Design Festival. Later exhibited at Pioneer Works in 2023 for a month-long engagement.
- Author, visual artist, and project director on companion book volume for *Medusa*, published by Hurtwood Press and shortlisted for a British Book Design Award in 2023.
- Technical director for *Kagami* (2023). Exhibited at The Shed in NYC, Manchester International, and most recently as part of Asia TOPA in Melbourne (2025). Role included managing software architecture across the project, as well as developing novel pipelines for the efficient processing of noisy volumetric data sets.
- Technical director for *The Life* (2019), developed in collaboration with Marina Abramović. Originally exhibited at the Serpentine Gallery in London in 2019, successfully sold at auction through Christie's in 2020, and most recently exhibited in Pesaro, Italy in 2024.

2015–2017 **Lead Perception Scientist**, *Magic Leap*, Florida.

- Founded and directed research efforts of the Quantified Experience team within Systems Engineering.
- Developed and conducted original psychophysical research experiments to quantify the physiological response of the human eye to novel augmented reality displays.
- Results of experiments crucial in guiding engineering efforts within internal Optics, Electrical Engineering, Computer Vision, and Deep Learning teams.

- 2012–2015 **Postdoctoral Researcher**, *University of Washington*, Washington.
- Developed experimental methods to measure navigational intent from hawkmoths within a virtual-reality environment, bridging research between animal navigation and visual neurobiology.
 - Collaborated with diverse engineering groups as part of the multi-institutional AIRFOILS grant, under principal investigator and MacArthur Fellow Tom Daniel.
 - Research data used to develop a control theoretic navigation policy suitable for use by autonomous flying robots.

Education

- 2004–2011 **PhD, Integrative Biology**, *The University of California*, Berkeley.
- Developed experimental techniques for *in situ* 3-D measurement of trajectories and postures by gliding canopy ants.
 - Designed and built field-portable wind tunnels for studying aerial maneuverability in gliding ants.
 - Designed and built robotic physical fluid dynamics experiments to quantify mechanics of aerodynamic stability and control in wingless insects.
 - Results provided new insights into potential evolutionary pathways for insect flight.
- 2003 **Bachelor of Science, Honours Physics**, *The University of Adelaide*, Australia.
- Conducted novel thesis research on hydrodynamics of swimming in snakes.
 - Awarded the David Sutton Memorial Prize for highest placement first class honours in experimental physics that year.
- 2000–2002 **Bachelor of Science, Physics**, *The University of Melbourne*, Australia.

Doctoral Thesis

- Title *The Descent of Ant*
- Supervisors Professors M.A.R. Koehl & Robert Dudley
- Description Kinematics and aerodynamics of gliding behaviour in wingless canopy ants, with implications for understanding of evolution of insect flight.

Selected Exhibitions

- 2025 *In Memory / Of Being*, State Library Victoria, Melbourne
- 2023 *Medusa*, Pioneer Works, Brooklyn
- 2021 *Medusa*, V&A Museum, London Design Festival
- 2019 *The Life*, Serpentine Gallery, London

Patents

- 2024 Depth plane selection for multi-depth plane display systems by user categorization. US patent US12008723B2.
- 2024 Eye center of rotation determination, depth plane selection, and render camera positioning in display systems. US Patent US20240108217A1
- 2024 Virtual and augmented reality systems and methods. US patent US11966059B2.

Selected Publications

- 2020 Zhu, H., Liu, H., Ataei, A., **Munk, Y.**, Daniel, T., Paschalidis, I.C. Learning from animals: How to Navigate Complex Terrains. *PLoS Computational Biology*.
- 2016 Yanoviak, S.P., **Munk, Y.**, and Dudley, R. Arachnid aloft: directed aerial descent in neotropical canopy spiders. *Journal of The Royal Society Interface*.
- 2015 **Munk, Y.**, Yanoviak, S.P., Koehl, M.A.R., and Dudley, R. The Descent of Ant: field-measured performance of gliding ants. *Journal of Experimental Biology*.
- 2014 Socha, J.J., Jafari, F., **Munk, Y.**, and Byrnes, G. How animals glide: from trajectory to morphology. *Canadian Journal of Zoology*.
- 2011 Yanoviak, S.P., **Munk, Y.**, and Dudley, R. Evolution and Ecology of Directed Aerial Descent in Arboreal Ants. *Integrative and Comparative Biology*.
- 2010 Yanoviak, S.P., **Munk, Y.**, Kaspari, M. and Dudley, R. Aerial manoeuvrability in wingless gliding ants (*Cephalotes atratus*). *Proceedings of the Royal Society B*.
- 2008 **Munk, Y.** Kinematics of swimming garter snakes (*Thamnophis sirtalis*). *Comparative Physiology and Biochemistry*.

Teaching Experience

- 2013 **Lecturer**, *University of Washington*.
Developed original course materials and labs for upper division science/engineering course on Integrative Biomechanics.
- 2004–2008 **Graduate Student Instructor**, *U.C. Berkeley*.
- IB127: Motor Control. Fall 2004.
 - BIO1B: Introductory Biology. Spring 2005.
 - IB304: Dissemination of Research. Fall 2005.
 - IB135: Mechanics of Organisms. Spring 2006.
 - IB127: Motor Control. Fall 2006.
 - IB304: Dissemination of Research. Spring 2007.
 - IB135: Mechanics of Organisms. Fall 2007.
 - IB135L: Mechanics of Organisms Lab Course. Spring 2008.
 - IB127: Motor Control. Fall 2008.

Technical and Creative Skills

Programming	Python, C/C++, CUDA
Statistical	R, numpy/scipy/pandas/sklearn, Tensorflow
Graphics	OpenGL/Vulkan, DirectX
Vision	OpenCV
3D	Unity, Blender, TouchDesigner
Audio	SuperCollider, ChucK, Max/MSP