

# Michael Karlovich

## *Curriculum Vitae 2022*

### **PUBLICATIONS**

**Karlovich MW**, Wallisch P. Scintillating Starbursts: Concentric Star Polygons Induce Illusory Ray Patterns. (2021). *i-Perception*. doi:10.1177/20416695211018720

Wallisch, P., Mackey, W., **Karlovich, M.**, & Heeger, D. J., (2021). The Visible Gorilla: Fast-Moving Objects Override Endogenous Attention. *arXiv preprint arXiv:1908.05736*.

**Preprint above. Revision currently in peer-review**

Cihan, E., Devinsky, O., Hesdorffer, D.C., Brandsoy, M., Li, L., Fowler, D.R., Graham, J.K., **Karlovich, M.W.**, Yang, J.E., Keller, A.E. and Donner, E.J. & Friedman, D., (2020). Temporal trends and autopsy findings of SUDEP based on medico-legal investigations in the United States. *Neurology*, 95(7), e867-e877.

Cihan, E., Hesdorffer, D.C., Brandsoy, M., Li, L., Fowler, D.R., Graham, J.K., **Karlovich, M.**, Donner, E.J., Devinsky, O. & Friedman, D., (2020). Socioeconomic disparities in SUDEP in the US. *Neurology* 94, no. 24 (2020): e2555-e2566.

Wallisch, P. & **Karlovich, M.**, (2019). Disagreeing about Crocs and socks: Creating profoundly ambiguous color displays. *arXiv preprint arXiv:1908.05736*

**Preprint above. Revision accepted by *Frontiers Psychology*.**

Tolete, P., Knupp, K., **Karlovich, M.**, DeCarlo, E., Bluvstein, J., Conway, E., Friedman, D., Dugan, P. & Devinsky, O., (2018). Lorcaserin therapy for severe epilepsy of childhood onset: A case series. *Neurology*, 91(18), 837-839.

### **EDUCATION**

- Union College, Schenectady, NY
- September 2011 - June 2015
- Major: Neuroscience
- Minor: Philosophy

### **EMPLOYMENT**

**Lead Software Developer and Designer Recursia, LLC**

**Website:** <https://recursia.shop>

**Mar. 2019 - Present**

- Develop product design technology and create neuroaesthetic visual media
- Develop fullstack automation software to streamline company operations

**Research Assistant, EEG Lab, The Nonduality Institute**

**Lake Hill, NY, May 2018 - Present**

**Supervisor: Zoran Josipovic, Ph.D.**

- Conducting neurophysiological experiments on cognition and meditation
- Assists with EEG setup and recording, technical problem solving /troubleshooting, and literature review
- Lead software developer; building custom pipelines and apps for working with EEG and ECoG data

**Note: The following three experiences represent one full-time position with NYU which entailed coordinating research for three projects between two collaborating labs**

**Clinical Research Coordinator, Comprehensive Epilepsy Center**

**Dept. of Neurology, NYU Langone, NYC, NY**

**Jun. 2017 - May 2018**

**Supervisor: Orrin Devinsky, M.D.**

- Performed data entry and assisted in managing clinical trials involving cannabidiol (CBD) and other novel interventions for epilepsy
- Co-author of an article published in *Neurology*<sup>®</sup>; responsible for data analysis, producing figures, reporting results, and drafting and editing of the manuscript

**Clinical Research Coordinator, Cognition and Epilepsy Lab,**

**Dept. of Neurology U.S. Dept. of Veteran Affairs, NYC, NY**

**Oct. 2017 - May 2018**

**Supervisor: Beth Leeman-Markowski, M.D.**

- Investigated cognitive decline and neurodegeneration in patients with epilepsy using EEG, eye-tracking, and cognitive data
- Performed subject recruitment, subject payment, data collection, data entry, data analysis, and technical problem-solving

**Clinical Research Coordinator, SUDC Registry**

**Dept. of Neurology, NYU Langone, NYC, NY**

**Jun. 2017 - Sep. 2017**

**Supervisor: Orrin Devinsky, M.D.**

- Performed data entry, organization, and analysis of the largest known database of death records and autopsy reports of Sudden Unexplained Death in Children (SUDC) for the “Sudden Unexplained Death In Children Registry and Research Collaborative”

**NOTEWORTHY COLLABORATIONS & INTERNSHIPS**

**Researcher and Artist, Recursia<sup>®</sup> LLC, NYC, NY**

**Mar. 2019 - May 2021**

**Collaborated with NYU neuroscience professor Pascal Wallisch, Ph.D.**

- Discovered and investigated the principles of “Scintillating Starbursts,” a novel class of visual illusion
- First-author of a peer-reviewed article published in the journal, *i-Perception*
- My article is currently in the top 5% of all research outputs ever tracked by Altmetric, the leader in measuring the quality and quantity of online attention of academic publications
- Finalist in the 2020 *International Illusion of the Year* contest hosted by the Neural Correlate Society

**Researcher and Artist, Recursia<sup>®</sup> LLC, NYC, NY**

**June 2019 - Aug. 2019**

**Collaborated with NYU neuroscience professor Pascal Wallisch, Ph.D.**

- Researched the cognitive influences of perceptual disagreements among people
- Co-creator of the first *purposely-created* ambiguous color illusions; co-responsible for stimulus creation, experiment design, programming analyses, and drafting and editing of the manuscript (in peer-review; preprint available)
- Featured in popular media outlets – see last page of CV for media features

**Collaborating Researcher & Data Analyst, Comprehensive Epilepsy Center**

**Dept. of Neurology, NYU Langone, NYC, NY, Dec. 2018 - Mar. 2019**

**Collaborated with Esma Cihan, M.D.**

- Programmed analyses, custom simulations, and reported results for epidemiological data involving Sudden Unexpected Death in Epilepsy (SUDEP)
- Contributed to two published articles, one of which was chosen as the featured research for the cover of the June 2020 volume of the *Neurology*<sup>®</sup> – the most widely read and highly cited peer-reviewed neurology journal

**Research Intern, Fox Lab, Center for Neural Science, NYU  
NYC, NY: June 2015 - Mar. 2019**

**Supervisor: Pascal Wallisch Ph.D.**

- Extended the work of my senior undergraduate thesis on the principles of capturing visual attention
- Responsible for subject payment and outreach; data collection and preprocessing; assisted with experiment design, data analysis, and the drafting and editing of the manuscript (in peer-review; preprint available)

**Research Intern, Cognitive Neurophysiology Lab  
Dept. of Neurology, NYU Langone, NYC, NY  
May 2016 - Jun. 2017**

**Supervisor: Lucia Melloni, Ph.D.**

- Investigated neural correlates of visual consciousness via behavioral data and intracranial brain recordings of patients exhibiting the rare condition, “blindsight”
- Managed and expanded custom neural data analysis pipeline

**Thesis student, Union College, Schenectady, NY  
Aug. 2014 - Jun. 2015**

**Co-advised by Pascal Wallisch Ph.D. (NYU) & Cay Hanley, Ph.D. (Union College)**

**Grade earned: A**

- Thesis title: *Mindfulness: Relationship Between Self-Report And Endogenous And Exogenous Resource Regulation*
- Replicated and extended the work of my 2014 NYU summer internship; additionally conducted experiments on the effect of mindfulness on attention and reported self-awareness

**Research Intern, Cognition and Perception Lab  
Center for Neural Science, NYU, NYC, NY  
Summer 2014**

**Supervisor: Pascal Wallisch, Ph.D.**

- Conducted research and experiments on visual attention
- Responsible for data collection, subject payment, and data coding; assisted with experiment design
- Gained research experience by learning how to program in MATLAB; to collect and analyze psychophysical data; to run and experiment and make publishable figures
- Broadened my experience by interacting with NYU professors and graduate students

## **COMPUTER SKILLS**

### **Operating Systems**

- Microsoft, Mac, and Linux

### **Commercial Software Skills**

- Adobe CC Suite: Acrobat DC, Audition, Dimension, Illustrator, Photoshop, Premier; Microsoft Office Suite

### **Programming Languages**

- Python, R, MATLAB, SQL, HTML, CSS, some JavaScript

### **Programming Concepts**

- Efficient algorithm design, JSON data, GPU array computing, parallel processing, Multidimensional indexing, Data queries, Web Scraping, Screen Scraping, UX design, Data visualization, Command Line

### **Web Development Concepts**

- AWS cloud storage, Google Analytics, Using website builders, Full-stack development, RESTful API, Remote computing (VPN, FTP, SSH, VNC)

### **Ecommerce Concepts:**

- E-commerce website setup, Shopify development, Google Ads, Google Search Console

## **RESEARCH & ANALYSIS SKILLS**

### **General Research Skills**

- Academic literature reviews, writing and publishing peer-reviewed articles, statistical literacy, data collection, IRB requests and reviews process, management and payment of participants, task automation via macros, batching and schedulers; working with massive spreadsheets and databases

### **General Analysis Skills**

- Scientific programming; Text, image, and audio data processing & visualization; Digital signal processing, Time series analysis, Statistics, Machine learning, neural nets, and artificial intelligence (novice); Supercomputing cluster experience, Monte-Carlo simulations

### **Neuroscience research skills**

- EEG recording and analysis, Electrocorticography analysis, Eye-tracking, MRI analysis (novice)

### **Digital Art and Design Skills**

- Color theory, 2D and 3D Geometric displays, Infinite tessellations, Mandalas, Abstract, Logo making, Surrealist scenes, Product Print design, Printing theory and best practices, short video production, Watermarking, Batch processing

## **PROFESSIONAL ATTRIBUTES**

- Highly creative; adept computational thinker, skilled with complex problem-solving, first-principles reasoning, and applying interdisciplinary approaches
- Able to communicate and harmoniously work with all types of artistic, business, scientific, engineering, and academic minded people
- Excel at both individual and collaborative projects; comfortable leading and being led

## **PRESENTATIONS**

### **The Roots of Disagreement - Think & Drink, "Subject" Bar**

188 Folk St. NYC, NY: Nov. 5th, 2019

### **Lorcaserin Therapy for Severe Epilepsy of Childhood Onset: A Case Series**

NYU Langone Health Neurology Symposium, Tisch Hospital, NYC, NY May 2018

### ***Mindfulness: Relationship Between Self-Report And Endogenous and Exogenous Resource Regulation***

Steinmetz Symposium, Union College, Schenectady, NY: May 2015

## **SELECT MEDIA FEATURES**

*For a full list of media features, please visit <https://www.mkarlovich.com/media>*

### ***New York University***

***A New Kind of Visual Illusion Uncovers How Our Brains Connect the Dots***

*By: James Devitt; Jun 29 2021*

### ***The Sun***

***This new optical illusion fools your brain – can you work out how?***

*By: Vanessa Chalmers; Jun 29 2021*

### **Live Science**

***A new type of optical illusion tricks the brain into seeing dazzling rays***

*By: Harry Baker; Jun 29 2021*

### **IFLScience**

***Brand New Type Of Optical Illusion Tricks The Brain Into Seeing Shimmering Rays***

*By: IFLS Staff; Jun 29 2021*

***Boggle Your Brain With The Best Illusion Of The Year Contest 2020***

*By: IFLS staff; Dec. 18<sup>th</sup> 2020*

### **You Are Not So Smart Podcast**

***Episode 176 (pt. 1 & 2): How a divisive photograph of a perceptually ambiguous dress led two researchers to build the nuclear bomb of cognitive science out of socks and Crocs***

*Pt.1 Aired Mar. 9, 2020; Pt. 2 Aired Mar. 25, 2020*

*Hosted by David McRaney*

### **Scientific American**

***A Pair of Crocs to Match the Dress: New research casts light on viral illusions***

*By Susana Martinez-Conde and Stephen L. Macknik; Dec. 12, 2019*

***Twenty-Eight Shades of Shoes: New research using Crocs explains the dress***

*By Stephen L. Macknik; Jan. 23, 2020*

### **Buzzfeed**

***First There Was “The Dress.” Now We’ve Got These Crocs***

*By Dan Vergano; Jul. 3, 2019*

## **VOLUNTEER POSITIONS**

### **Member of the Board of Directors**

**Foundation for the Study of American Yoga, Bovina Center, NY**

**Jun, 2016-Present**

A 501(c)(3) non-profit organization incorporated in 1969, The Foundation for the Study of American Yoga maintains an educational center for the continued development, practice, and teaching of American Yoga: a synthesis of various forms of yoga, mindfulness, meditation, alignment, tension-releasing exercises, and breathing techniques.

## **HOBBIES**

- Amateur woodworker
- Certified meditation and mindfulness instructor
- Cooking
- Electric bass guitar
- Writing poetry
- Writing software to automate and streamline tasks