# Christopher **ICK**

New York University 2017 | BS Physics
New York University 2024 | PhD Data Science

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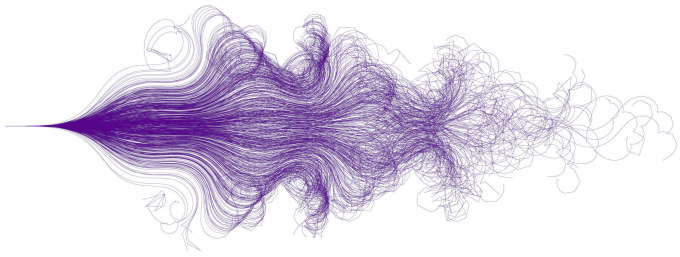

**Who am I ?** | I am a PhD candidate at NYU's Center for Data Science in the Music and Audio Research Lab (MARL)
**What do I do ?** | I study signals, sound, acoustics, and music through the lens of physics, signal processing, and deep learning

## Education and Honors

2019-2024 (Anticipated) — **Doctor of Philosophy**, Data Science, New York University
- Advised by Prof. Brian McFee
- Coursework in Deep Learning, Recommender Systems, Time Series Analysis, MIR
- Urban Scholars Research Fellow

2018-2019 (Transferred to PhD Program) — **Master of Science**, Data Science, New York University
- DeepMind Fellowship

2013-2017 — **Bachelor of Science**, Physics, New York University
- Minors : Computer Science/ Math
- Graduated with honors
- Athletic Honor Roll (Fencing)
- Deans List
- Sigma Pi Sigma Honors Society
- Dean's Undergraduate Research Grant (Summer 2015, Winter, Spring, Summer, and Fall 2016)

## Publications

- Y. Masayuma, G. Wichern, F. G. Germain, **C. Ick**, J. Le Roux, "Retrieval-Augmented Neural Field for HRTF Upsampling and Personalization," *In review*, 2024
- R.E. Peterson, A. Tanelus, **C. Ick**, et al. "Vocal Call Locator Benchmark (VCL) for localizing rodent vocalizations from multi-channel audio," *In review*, 2024
- I.R. Roman*, **C. Ick***, et al. "Spatial Scaper : A Library to Simulate and Augment Soundscapes for Sound Event Localization and Detection in Realistic Rooms," *IEEE ICASSP*, 2024
- **C. Ick**, B. McFee, "Leveraging Geometrical Acoustic Simulations of Spatial Room Impulse Responses for Improved Sound Event Detection and Localization, " *DCASE Workshop*, 2023
- **C. Ick**, A. Mehrabi, and W. Jin, "Blind Acoustic Room Parameter Estimation Using Phase Features, " *IEEE ICASSP*, 2023
- M. Hübner, D. Huppenkothen, P. Lasky, A. Inglis, **C. Ick**, and D. Hogg, "Searching for quasi-periodic oscillations in astrophysical transients using Gaussian processes," *The Astrophysical Journal*, 2022
- L. Bondi*, G. Chuang*, **C. Ick***, A. Dave*, et al.; "Acoustic Imaging aboard The International Space Station (ISS) : Challenges and preliminary results," *IEEE ICASSP*, 2022
- **C. Ick** and B. McFee, "Sound Event Detection in Urban Audio with Single and Multi-Rate PCEN," *IEEE ICASSP*, 2021
- **C. Ick** and V. Lostanlen, "Learning a Lie Algebra from Unlabeled Data Pairs," *Deepmath Conference* (Abstract/Poster), 2020

*Equal contribution

## Ongoing Work

| | |
|---|---|
| Spatial RIR Interpolation | Learning continuous multichannel RIR representations from limited measurements |
| Spatial RIR Disentanglement | Disentangling elements of SRIRs for localization and spatial understanding |
| Dissertation Writing | Writing my dissertation |

Figure source : Cook, Matthew "It Takes Two Neurons to Ride a Bicycle", Demo at NIPS 2004

## Professional Experience

Present
June 2024
Mitsubishi Electric Research Laboratories, Cambridge, MA
### Research Intern
*Advisors* : Gordon Wichern, Yoshiki Masuyama, Jonathan Le Roux
Deriving and implementing new models and optimization methods for audio analysis with applications to sound event detection, speech enhancement, and source separation in multi-source and/or far-field scenarios, using advanced machine learning techniques.

August 2022
June 2022
Sonos, Boston, MA
### Advanced Technology Intern
*Advisors* : Wenyu Jin, Adib Mehrabi
Developed algorithms and datasets for blind room parameter estimation w/ CNNs for use in smart speaker technologies (*Results published in ICASSP 2023*)

August 2021
May 2021
Robert Bosch LLC, Pittsburgh, PA
### Audio AI Intern
*Advisors* : Luca Bondi, Samarjit Das
Designed dynamical acoustic simulations for replicating audio imaging experiments onboard the international space station (*Results published in ICASSP 2022*)

August 2019
May 2019
Amazon Music, San Francisco, CA
### Applied Scientist Intern
*Advisors* : Emile Richard, Katherine Ellis, Gert Lanckriet
Developed algorithms for cover song detection in the Amazon Music catalog, improving recall by over 60%

September 2018
May 2017
NYU Physics Department, New York, NY
### Junior Research Associate
*Advisors* : David Hogg, Kyle Cranmer
Developed Gaussian process models for estimating solar flare oscillations and low-count dark matter detection experiments (*Results published in Astrophysics Journal 2022*)

## Teaching Experience

May 2024
September 2016
New York University, New York, NY
### Teaching Assistant
- **How Things Work** (Fall 2023, Spring 2024)
- **Intro to Experimental Physics II** (Spring 2019)
- **Data Science for Everyone** (Fall 2019)
- **Quarks to Cosmos** (Fall 2018)
- **Advanced Experimental Physics** (Fall 2016, Spring 2017, Fall 2017, Spring 2018)

August 2023
May 2023
NYU Music and Research Lab, Brooklyn, NY
### REU Mentor
Mentored a visiting undergraduate in developing, researching, and presenting a research project on spatial audio annotation and visualization
### ARISE Mentor
Mentored a visiting high-school student in introductory python, 3D data processing, and visualization

May 2017
September 2014
NYU Physics Department, New York, NY
### Adjunct Undergraduate Instructor
Taught groups of students entry-level kinematics, electricity and magnetism, optics, thermodynamics, fluid dynamics, and other physics subjects

## Interests

**Exercise :** Road Cycling/Cyclocross, Rock Climbing, Snowboarding, Scuba Diving
**Technology :** Custom mechanical keyboards, Self-hosted media/networking server, Super Smash Bros. Melee
**Artistic :** Film photography, Synthesizers, Classical and Jazz piano
**Community :** Greene Hill Food Co-op Owner/Member, Jane Bailey Community Garden Events Committee