

# Koundinya Vajjha, CQF

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28 years

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## Address:

2715 Murray Ave,  
Pittsburgh, Pennsylvania,  
15217, USA.

## Current position

R&D Engineer at Imandra.

## Previous work experience

- Quantitative Analyst CRISIL, an S&P Global Company  
Chennai, India 2016 - 2017

## Education

- University of Pittsburgh Pittsburgh, Pennsylvania  
Ph.D. Mathematics 2018-2022
- University of Western Ontario London, Ontario  
MSc. Mathematics 2017 - 2018
- Fitch Learning  
Certificate in Quantitative Finance 2017
- Indian Statistical Institute Kolkata  
Master of Mathematics 2014 - 2016
- Indian Statistical Institute Bangalore  
Bachelor of Mathematics 2011 - 2014

## Academic Publications and Preprints

- Formal Verification of a Stochastic Approximation Theorem (with Barry Trager, Avi Shinnar and Vasily Pestun) accepted to **ITP 2022**.
- The Reinhardt Conjecture as an Optimal Control Problem II (with Thomas Hales), work-in-progress.
- CertRL: Formalizing Convergence Proofs for Value and Policy Iteration in Coq (with Avi Shinnar, Barry Trager, Vasily Pestun and Nathan Fulton) presented at **CPP 2021**.
- A formal proof of PAC Learnability of Decision Stumps (with Joseph Tassarotti and John Tristan) presented at **CPP 2021**.
- On a Definite Integral of the Fractional Part Function in Resonance: Journal of Science Education, May 2012, Volume 17, Number 05.
- On Pythagorean Triples of the Form  $(i, i + 1, k)$  in Resonance: Journal of Science Education, September 2009, Volume 15, Number 09.

## Areas of Interest

Formal Verification, Discrete Geometry, Geometric Optimal Control.

## Internships

1. Research Internship at the **MIT-IBM Watson AI Lab, IBM Research**, 2020.
2. Research Internship in **Oracle Labs**, 2019.
3. Summer internship in **Essex Lake Group LLC**, 2013
4. Summer internship at the **Indian Institute for Science Education and Research, Mohali**, 2013.
5. Summer internship as a JNCASR Fellow, at the **Indian Institute for Science Education and Research, Kolkata** in 2012.

## Conferences

1. Participant at the **DeepSpec Summer School, 2018**, July 2018 at Princeton University.
2. Participant at the **Vladimir Voevodsky Memorial Conference** at the Institute for Advanced Study, Princeton, September 2018.
3. Participant at the **Homotopy Type Theory Summer School** at Carnegie Mellon University, August 2019.
4. Participant at **Homotopy Type Theory - 2019** at Carnegie Mellon University, August 2019.
5. Participant at the **Category Theory Octoberfest**, October 2019 at Johns Hopkins University.
6. Participant at **Optimal Control, Optimal Transport, and Data Science - Institute for Mathematics and Applications – University of Minnesota**, November 09 - 13, 2020.
7. Participant at the **Certified Programs and Proofs, 2021**, January 2021.
8. Selected to participate in the **2021 Galois Summer School for Trustworthy Machine Learning, Artificial Intelligence, and Data Science**, June 2021.

## Talks

1. Oral presentation “On Pythagorean Triples of the Form  $(i, i + 1, k)$ ” at the **International Congress of Mathematicians**, Hyderabad, August 2010.
2. Talk on “Voevodsky’s Simplicial Modal of HoTT” at the **CMU HoTT Seminar**, November 2018.
3. Talk on the “Documentation of Formal Abstracts” at **Hanoi Lean** on June 2019.
4. Talk on “Metaprogramming in Lean” at **Hanoi Lean** on June 2019.
5. Talk on “Formal Proof of PAC Learnability of Decision Stumps” at the **CMU-Pitt Lean Working Group** on November 2019 and also at **Lean Together 2020**, January 2020.

6. Talk on “CertRL: Formalizing Convergence Proofs of Value and Policy Iteration in Coq” at **Lean Together 2021** and also at **CPP 2021**, January 2021 and also at **CISAT Seminar - ITU Copenhagen**, May 2021.
7. Instructor for **Monsoon Math Camp**, teaching Formal Proofs using the Lean Theorem Prover – July 2021
8. Talk on “A Mathematical Analysis of Pāṇini’s Śivasūtras in the Aṣṭadhyāyī” at the **CMU-Pitt Lean Working Group** in November 2021.

## Technical Skills

SAS, R, Python, Lean, Coq, Haskell, Matlab, Octave.