

# Veome Kapil

✉ veomekapil@gmail.com — ☎ (313) 482 8646 — [in](#) LinkedIn — [GH](#) GitHub — [ID](#) ORCID — [veomekapil.com](#)

## Education

### Johns Hopkins University

Doctor of Philosophy (Ph.D). in Physics

Master of Arts (M.A.) in Physics

Baltimore, MD

*Expected: July 2026*

*Aug 2023*

### Princeton University

Bachelor of Arts (B.A.) in Physics (GPA: 3.74/4.0)

Certificate in Applications of Computing

Princeton, NJ

*June 2021*

*June 2021*

## Skills

- **Programming Languages:** Python, SQL, C++, Excel, Java, Unity, Mathematica
- **Data Science Tools:** TensorFlow, Scikit-learn, PyTorch, Pandas, NumPy, SciPy, Matplotlib, Geopandas, Shapely
- **Statistics:** Bayesian Inference, Model Selection, A/B Testing, Bootstrapping
- **Machine Learning:** Convolutional Neural Networks (CNNs), Regression Models, Time-domain signal processing, Feature Engineering, Deep Learning

## Work Experience

### Data Science Internship

Maryland New Directions, Baltimore, MD

*Summer Data Science Intern*

*June 2024 – Sep 2024*

- Used ML regression models to predict client reach for non-profit aimed at proving employment opportunities to impoverished Baltimore communities, recommending target areas to achieve a **45% increase** in the client base.
- Integrated US Census data with company databases, deploying automated A/B testing and visualization scripts to continuously monitor socio-economic and demographic trends among clients.
- Presented actionable insights to non-technical stakeholders, which resulted in a new program to improve training effectiveness and retention for the most vulnerable clients.

### Virtual Reality Research Internship

NeuroEquilibrium Diagnostic Systems, Jaipur, IND

*Summer Intern*

*June 2016 – Aug 2016*

- Developed Virtual Reality (VR) applications for rehabilitation of patients with neurological disorders.
- Communicated with a diverse team of neurologists, medical practitioners, and company executives to translate company requirements into practical and effective VR experiences.
- Operated in a self-directed environment, independently managing resources and workflows in the new VR division.

## Research Experience

### Systematic Bias from Gravitational Waveform Modeling

Johns Hopkins University

*Lead Author*

*Oct 2022 - Apr 2024*

- Conducted a statistical study of current gravitational wave model accuracy for future detector applications, using time-domain signal processing and Fisher information matrices to unveil a predicted failure rate of **up to 20%**.
- Used Bayesian model inference and spline regression to determine a requisite improvement in model accuracy **by a factor of 10**, outlining specific improvements in a paper published in the peer-reviewed *Physical Review D* journal.

### Calibration of Neutron Star Natal Kick Velocities

Johns Hopkins University

*Lead Author*

*Jan 2022 - Sept 2022*

- Determined optimal parameters for a new supernova model using Bayesian inference, performing model selection via KS tests to propose the model most compatible with astronomical observations.
- Statistically compared the new model to older supernova models, estimating **40% fewer** predicted observable binary neutron stars. Published findings in the prestigious *Monthly Notices of the Royal Astronomical Society* journal.

### Improving Trajectory Reconstruction of Charged Particles at the LHC

Princeton University

*OURSIP Summer Research Intern*

*June 2020 - Aug 2020*

- Applied a Convolutional Neural Network (CNN) to distinguish between single and overlapping particle images from the Compact Muon Solenoid (CMS) detector at the LHC.
- Created 3D and 2D visualizations of overlapping particle trajectories that informed improvements in trajectory reconstruction at the CMS collaboration.