# Vishal Johnson

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## EDUCATION

**Master of Science in Physics**                                                                      Oct. 2020 – present
Ludwig-Maximilians-Universität München

**Bachelor of Technology in Electrical Engineering | Minor: Engineering Physics**   Aug. 2013 – May. 2016
Indian Institute of Technology (Indian School of Mines), Dhanbad

**High School**                                                                                              Jul. 2011 – May. 2013
Kendriya Vidyalaya, Mysuru

## RESEARCH WORK

I am currently studying quantum information theory and learning how to interpret information physically. The theory of quantum information sparked the idea that 'information' is physical just like matter and energy and I aim to study this characterization of information and see where it leads. My long-term research interest lies in the merger of physics, mathematics and information theory.

**Physics of Information**

The major research theme I am working on is the physics of information. It is certain that the "true" nature of information is quantum mechanical, as quantum information theory claims. However, there is a lot more to be done with this, including the use of statistical mechanics to study the properties of a large number of interacting information processors that leads to the behavior of information as we know it. These are some of the research ideas I am pursuing.

**Fuzzy Algebra**

Working on developing a fuzzy algebra inspired evaluation system that aims to capture the fuzziness in human decision-making.

- Working on a mathematical base that would be suitable in achieving this goal; quantum information seems to be a promising avenue for developing this idea.

- Later plans include developing a web-based interface that would improve usability.

**Cryptography**

Working on a cryptosystem that uses the randomness of nature in order to achieve perfectly secure cryptography.

- Researching its possible links with quantum information.

**Big Five Personality Traits**

Had worked on a system that uses speech data to infer personality traits of a person using the big five personality traits as a blueprint and an artificial neural network as the classifier under the Human Interaction and Artificial Intelligence group at the Department of Electronic Systems Engineering, Indian Institute of Science, Bengaluru.

## CERTIFIED ONLINE COURSES

**18.032x: Differential Equations: 2x2 Systems** 2020
MITx on edX

**24.09x: Minds and Machines** 2020
MITx on edX

**10.50.1x: Analysis of Transport Phenomena 1: Mathematical Methods** 2020
MITx on edX

**24.118x: Paradox and Infinity** 2020
MITx on edX

**Understanding Einstein: The Special Theory of Relativity** 2019
Coursera

**8.06x: Applications of Quantum Mechanic** 2019
MITx on edX

**QTM3x: The Building Blocks of a Quantum Computer: Part 2** 2018
edX

**ANU-ASTRO4X: Astrophysics: Cosmology** 2018
edX

**ANU-ASTRO3X: Astrophysics: The Violent Universe** 2018
edX

**ANU-ASTRO2X: Astrophysics: Exploring Exoplanets** 2018
edX

**ANU-ASTRO1X: Astrophysics: Greatest Unsolved Mysteries of the Universe** 2018
edX

**QTM3x: The Building Blocks of a Quantum Computer: Part 1** 2018
edX

**Cryptography 1** 2017
Coursera

## WORK EXPERIENCE

**Teacher of Physics and Mathematics** Dec. 2017 – Sep. 2020
Plato's Planet Training Centre, Dubai
- Teaching high school level mathematics and physics mainly for the A level exams.
- Designing engaging education projects.
- Some managerial duties such as timetabling.

**Intern** Jul. 2016 – Dec. 2016
Department of Electronic Systems Engineering, Indian Institute of Science, Bengaluru
- Searching for workable machine learning algorithms for language processing.

## SCHOLASTIC ACHIEVEMENTS

- Secured all India 4th rank in the Joint Entrance Screening Test 2017 (Theoretical Physics)

- Qualified the IIT-JEE of 2013 ranking among the top 0.5% in India

- Qualified for the Indian National Astronomy Olympiad 2012-13

- Qualified for and attended the Indian National Mathematics Olympiad training camp held in Indian Statistical Institute Bengaluru 2011-12

## EXTRACURRICULAR WORK

- Developed an infinite precision system to deal with slider objects on Mathematica for Hackfest ISM 2016

- Designed and built the Electrical and Steering systems of a Go-Kart for GKDC 2015

- Participated in Google Science Fair 2013

- Co-directed 'The Importance of being Ernest' performed by the college theatre group