Kumar AYUSH

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Seeking learning opportunity for May-July 2016

Awards and Achievements

Jul 2013 **Silver Medal** at International Olympiad on Astronomy & Astrophysics, Greece

Oct 2012 **Silver Medal** at International Astronomy Olympiad, Korea

2013 Recipient of **Kishore Vaigyanik Protsahan Yojana Scholarship** awarded by the Govt. of India to motivate students interested in research

2014 Awarded **All Rounder Trophy** at School Farewell for overall excellence

2012–2013 Felicitated twice with the **Infosys Award** for Olympiad Medalists

2012–2014 **Olympiad Orientation–Cum–Selection Camp – Astronomy**.

- Awarded the Best Answer to a Challenging Data Analysis Question in 2012
- Awarded the Best Observer in 2013
- Awarded the Best Answer to a Challenging Theoretical Question in 2014

2010 Holder of **NTSE Scholarship** awarded by NCERT, Govt. of India

Research Experience & Course Projects

Winter 2015 **Variability analysis for the globular cluster NGC 2419**,
NIUS – Astronomy, Prof. Priya Hasan, MANUU.

- Searched and cataloged variable stars in the globular clusters
- Developed skills regarding photometric data analysis

Fall 2015 **Meta-population and Coupled Logistic Maps**,
Non Linear Dynamics – Course Project,
Prof. Amitabha Nandi, Prof. Raghunath Chelakkot, IITB.

- Investigate the evolution of a network of cities using non-linear dynamics
- Study stabilization from chaos of coupled logistic maps

Winter 2013 **An X-Ray Study of Black Hole Candidate X Norma X-1**,
NIUS – Astronomy, Prof. Manojendu Choudhury, CEBS – UM.

- Analyzed timing information from RXTE to detect quasi-periodic oscillations
- Fitted obtained spectra & observed unusual oscillations in the inner radius

Winter 2012 **Estimation of Photometric Redshifts Using ML Techniques**,
NIUS – Astronomy, Prof. Ninan Sajeeth Philip, IUCAA, Pune.

- Estimated red shifts based on SDSS color data using artificial neural networks
- Compared the performance of neural network against other ML techniques

Leadership & Organizational Experience

Summer 2015 **Indian National Astronomy Olympiad Program 2015**,
Resource Person for the selection of the Indian teams to IAO and IOAA.

- Student facilitator for mentoring and evaluating students
- Generated and evaluated questions for the selection procedure
- IOAA Team India got best result in 9 years, topped the medal tally and won team competition

Spring 2015 **IPhO–Rum, 46th IPhO**,
International Physics Olympiad 2015, Mumbai, India.
- Created a first of its kind browser application to be used during academic meetings with functionalities such as file management, voting & feedback
- Worked in the academic logistics team during the Olympiad helping with a variety of proceedings

2015-16 **Convener**, *Web n Coding Club*, IIT Bombay

Web & Coding Experience

Fall 2014 **AviPulse**,
A non-profit initiative to build the world's first bird identification system.
- Implement a developed sound processing algorithm to identify the bird species
- Create a web tool which takes the bird voice as the input

2014–2015 **Gruppo Leopardo Inc**,
www.gruppoleopardo.com | *www.grandimagazzinibomboniere.it*.
- Designed & maintained e-commerce websites for the company based in Italy

Spring 2015 **PNR Predictor**,
An app as a part of a hackathon, code.fun.do, Microsoft.
- Built an app which predicts probability of ticket confirmation based on an statistical model
- Runner up at institute level and participated in Finalists' Forum

Fall 2014 **Video Attendance**,
Face Detection using Hidden Markov Models and Discrete Cosine Transforms,
Prof. D.B. Phatak, IIT, Bombay.
- Programmed detection of faces in a video capture for marking the attendance of the student
- Learnt about hidden Markov Models and implemented a prototype based on DCT

Miscellaneous Projects

Fall 2014 **Kelvin Water Drop**, Maths n' Physics Club, IIT, Bombay.
- Built a working model of the Kelvin Water Drop experiment
- Demonstrated before an audience followed by a discussion on concepts involved

Talks and Workshops

Fall 2015 **Positional Astronomy**, Krittika-Astronomy Club, IIT, Bombay.
- Spherical trigonometry and astronomical co-ordinate systems
- Fundamental applications such as prediction of eclipses

Fall 2015 **Scratch Day**, Web n Coding Club, IIT, Bombay.
- Conducted a workshop on MIT Scratch to an audience of 100 students
- Aimed to be an introduction to programming for freshmen

Spring 2016 **Photometry**, Krittika-Astronomy Club, IIT, Bombay.
- Introduced students to essential physics and tools for photometry
- Demonstration on light curve analysis from planethunters.org

Courses Undertaken

CSE Introduction to Programming, Networks, Data Structures and Algorithms

Physics Electricity and Magnetism, Classical Mechanics, Non Linear Dynamics, Special Theory of Relativity, Quantum Mechanics I, Waves Oscillations and Optics

Maths Calculus, Linear Algebra, Ordinary Differential Equations, Complex Analysis

Other Introduction to Electronics, Signals and Systems, Digital Systems, Computational Fluid Dynamics

Computer skills

Basic	MATLAB, Photoshop, Illustrator, C#
Intermediate	LaTeX, OpenOffice, Linux, Microsoft Windows, OpenCV
Advanced	Python, C/C++, HTML, JavaScript, PHP

Languages

English	Near Native	*excellent command*
German	Basic	*learning*

Interests

- Music
- Cooking
- Travel
- Reading