

SAHEL MOHAMMAD IQBAL

Integrated Master's graduate in physics from NISER.

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Education

Integrated Master's in Physics

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH

Aug 2017 - Jul 2022

Bhubaneswar, Odisha

- Cumulative GPA: 9.07/10

Senior Secondary School

CENTRAL BOARD OF SECONDARY EDUCATION

May 2015 - Mar 2017

Thrissur, Kerala

- Aggregate score: 95.4%

Research Experience and Academic Projects

M.Sc. project in debiasing datasets with generative models.

Jan 2022 - Present

- Advisor: Dr. Subhankar Mishra, Machine Learning and Privacy Lab, NISER.
- Given a biased dataset, how can we automatically identify biases and correct for them? This is the question that I'm trying to address.
- This work is ongoing.

Neural network compression using pruning and quaternions.

Aug - Dec 2021

- Advisor: Dr. Subhankar Mishra, Machine Learning and Privacy Lab, NISER.
- Pruning and implementing networks using quaternions are two ways of compressing a neural network. I empirically studied the consequences of using both these techniques simultaneously.
- The broad motivation for this work was to increase the performance that is achievable on resource-constrained devices.
- We found that quaternion models outperform their real counterparts at very high sparsity levels.

Comparative study of face detectors for masked-face detection.

Oct 2020 - Jul 2021

- Advisor: Dr. Subhankar Mishra, Machine Learning and Privacy Lab, NISER.
- Conducted a comparative study of state-of-the-art face detection algorithms at the task of masked-face detection.
- This work was motivated by the advent of the Covid-19 pandemic and subsequent mask mandates by governments, and a dearth of research regarding masked-face detection.

Theory and modeling of atmospheric radiative transfer.

Jan - Jul 2020

- Advisor: Dr. Jaya Khanna, Regional Hydro-Climatology Lab, NISER.
- Conducted a theoretical study and numerical simulation of the heating and emission profiles of the atmosphere, with a preliminary attempt to understand how varying CO₂ levels affect global heating. [Report](#).

Understanding QGP detection with scattering experiments.

Jun - Jul 2019

- Advisor: Dr. Sanjib Muhuri, Variable Energy Cyclotron Center (VECC), Kolkata.
- Explored the basic physics behind collision experiments. [Report](#).

Thin-film fabrication for plasmonic applications.

May - Jul 2018

- Advisor: Dr. S N Potty, Thin-Films and Nano-materials Lab, Centre for Materials for Electronics Technology (C-MET), Thrissur. [Report](#).
- Fabricated thin-films for plasmonics applications.

Preprints

- Sahel Mohammad Iqbal, Subhankar Mishra. **Neural Networks at a Fraction with Pruned Quaternions**. 2021. [Link](#), [Code](#).
- Sahel Mohammad Iqbal, Danush Shekar, Subhankar Mishra. **A comparative study of face detection algorithms for masked face detection**. 2021. [Link](#).

Awards and Scholarships

PM Foundation Fellow

Jun 2016 - Present

Selected as one of 10 awardees from an applicant pool of more than 1000 students statewide for a scholarship program for high school students based on leadership potential and academic success. [Certificate](#).

Inspire Scholar

Jul 2017 - Present

Selected for a national scholarship program by the central government to promote science based on academic success in high school.

Skills

Programming Languages: Python, C/C++, Javascript.

Scientific Packages and Libraries: Extremely familiar with PyTorch, TensorFlow, Scipy, Pandas, Matplotlib, Numpy, and Jupyter.

Web Technologies: HTML/CSS, React, Django, GatsbyJS, GraphQL

Online Courses: CS50 Introduction to Artificial Intelligence with Python (2020), MITx 2.01x: Elements of Structures (2016). [Certificates](#).

Leadership and Extracurriculars

Hostel President

May 2018 - Jun 2019

Tackled two important issues during my one-year tenure as the elected president of my residential hostel in college in my sophomore year.

- Helped break the cycle of freshmen hazing by seniors through effective campaigning among batch-mates.
- Based on common consensus among residents, made the hostel environment peaceable and more conducive to learning for all students by being the first to enforce a strict ban on cigarettes, alcohol, and drugs on hostel premises.

Science Outreach Committee

Took part in several activities to disseminate scientific knowledge, including but not limited to guiding high-school students on observing the night sky (*image*), demonstrating various experiments on NISER Open Day, and teaching undergraduates at the neighboring IIT Bhubaneswar to set up telescopes.

Magazine Editor

Served on the editorial board for the very first edition of [Kshitij](#), NISER Astronomy Club's magazine.

Occasional Writer

I like to write about various social issues. A couple of my articles are available on a website that I built called [The Student Watch](#).