

NICY SCARIA

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I am broadly interested in **natural language processing, large language models, generative AI, knowledge graphs, reinforcement learning, and computational social sciences**. I am passionate about education. My research interests are in building **personalized adaptive learning solutions** using lightweight models that can be deployed at scale for students in an Indian context.

EDUCATION

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- INDIAN INSTITUTE OF SCIENCE, Bengaluru** **From August 2022**
PhD (Computational and Data Sciences), Current CGPA of 9.10/10
- COLLEGE OF ENGINEERING TRIVANDRUM, Trivandrum** **August 2017 - July 2019**
Master of Technology (Control Systems), Graduated as a topper with a CGPA of 9.44/10
Relevant Coursework: Advanced Mathematics and Optimization Techniques, Optimal Control Theory, Nonlinear Control Systems, Sliding Mode Control, Flight Dynamics and Control, Robust Control.
- SCMS School of Engineering and Technology, Ernakulam** **August 2012 - June 2016**
Bachelor of Technology (Electrical and Electronics Engineering), Graduated with Honours CGPA of 8.41/10

TECHNICAL SKILLS

Programming languages: C, Python, R, HTML, CSS
Machine learning and deep learning frameworks: NumPy, pandas, Matplotlib, PyTorch, TensorFlow, Keras
Electrical and electronics engineering: MATLAB, Simulink, Stateflow

PROFESSIONAL EXPERIENCE

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- INDIAN INSTITUTE OF SCIENCE, Bengaluru**
Research Scholar, Computational and Data Sciences Department **From August 2022**
- Working on developing personalised adaptive learning systems through artificial intelligence to enhance student learning.
- Teaching Assistant, DA 204o, Data Science in Practice** **From August 2023**
- Conducting tutorials for M.Tech.(Online) students on NumPy, pandas, Matplotlib, NLP, transformers, and Hugging Face.
 - Created assignments and quizzes and gave feedback to students based on evaluation.
- Teaching Assistant, DA 202o, Introduction to Data Science** **August 2022 to December 2022**
- Conducted tutorials for M.Tech.(Online) students on various topics including probability, linear algebra, statistics, and machine learning.
 - Created assignments and quizzes and gave feedback to students based on evaluation.
- Project Scientist I, Centre for Continuing Education** **May 2021 to July 2022**
- Worked with the M.Tech.(Online) Programme Team for supporting faculty in Artificial Intelligence, Data Science and Business Analytics, and Electronics and Communications Engineering streams.
 - Created learning materials like interactive simulations and videos using GeoGebra and Manim libraries respectively, for Linear Algebra (E1 219o) and Random Processes (E2 212o) courses.
 - Created a Student Lifecycle Management portal for M.Tech.(Online) students of IISc for maintaining student records, student admission, student advising, academic structure, class schedule, and services for teaching and research.
- MOKUSEI INTELLIGENCE, Bengaluru**
Head of Technology (part-time) **January 2022 to June 2022**
- Led 2 teams of developers creating a crowdfunding website/platform for education (investment-based) and a mobile application for the prediction of scores and attaining scholarships based on these predictions.
 - Developed technological strategies to align with the business goals and ensure the quality of the end product.
- TEACH FOR INDIA, Chennai**
Fellow **June 2019 to April 2021**
- Taught English, Science, and Literacy to one hundred and one grade seven students and Social and Emotional

skills to one hundred and seventy-four grade 7 and 8 students at Chennai High School, Thiruvankatasamy Street, Pulianthope. Taught all subjects to thirty-seven grade four students at Anjuman Matriculation Higher Secondary School (Primary), T. Nagar, for the academic year (2019-2020).

- Led multiple city-level Fellows-led virtual initiatives such as Madras Party (a platform for students) and Petror Koodam (a space for parents across Teach for India classrooms in the city).
- Assisted the school team of 5 in creating tracking systems for collecting and analysing student data to administer data-driven interventions and developed frameworks for school projects.

Student Leadership Intern

May 2020 to June 2020

- Created sequenced learning circle plans for Social, Emotional, and Ethical Learning and designed activities and performance tasks to build 21st Century Skills in students for fellows across the city.
- Worked with different stakeholders within and outside the organisation to understand various approaches to student leadership in the region.

YOUNG INDIA FOUNDATION, New Delhi

Data and Research Intern - YIF Think Tank

December 2019 to March 2020

- Published an [educational research paper](#) with a team of 5 research interns in Academia to provide suggestions to Think Tanks such as Niti Aayog and the Centre for Civil Society.
- Explored different 21st Century Skills Framework, their implementation, and assessment to hypothesize factors contributing to the skills gap in the youth.
- Analysed the National Education Policy - Draft to investigate how the policy is designed to equip the Indian youth to be global leaders.

TATA ELXSI, Trivandrum

Project Intern - Jaguar Land Rover Tata Motors Limited (JLR TML)

May 2018 to June 2019

Tata Elxsi demonstrated [Robo-Taxi](#) at CES 2020 in Las Vegas

- Engineered an adaptive PID controller designed in MATLAB/SIMULINK using MicroAutoBox II to operate the steering system autonomously in a Suzuki Ignis (Robo-Taxi).
- Developed a time series model of the Electric Power Steering in Suzuki Ignis using System Identification by perturbing the system with different reference signals.
- Designed an Adaptive Model Predictive Controller for motion planning.

College of Engineering Trivandrum, Trivandrum

Teaching Assistant

August 2017 to June 2019

- Systems and Control Lab (EE332), August 2018 Term
- Electronic Circuits Lab (EE231), January 2018 Term
- Electrical Machines Lab (EE333), August 2017 Term

RESEARCH ARTICLES/PUBLICATIONS

- Assessment of Large Language Models' Ability to Generate Relevant and High-Quality Questions at Different Bloom's Skill Levels accepted at **Generative AI for Education (GAIED), NeurIPS'23**
- Research, Y. I. F., D., **Scaria, N.**, Gunasekaran, P., & Raheja, S. (2020). [Significance of Inclusivity and Diversity Framework in 21st Century India](#). Young India Foundation's Research.
- https://www.academia.edu/40429885/Electric_Power_Assisted_Steering_Control_for_Autonomous_Driving

PROJECTS

Pedagogical Question Generation at Different Bloom's Taxonomy Skills

From August 2023

- Assessing the quality and relevance of pedagogical questions generated by LLMs at different Bloom's taxonomy levels in different subject areas through prompt-tuning to identify the best model for the task.
- Generating synthetic data using LLMs to train lightweight models for generation and classification tasks.
- Developing knowledge graphs for specific concepts across different subject areas.

Conversational Engine at Different CEFR Levels of English Language

From August 2023

- Developing conversational engine for different CEFR levels, namely A1, A2, B1, and B2, to learn listening, speaking, and grammar skills for non-native English speakers.

Catalysts for Change

October 2020 to April 2021

- Developed a curriculum for students with two Teach for India fellows to cultivate leadership skills and act as

catalysts for sustainable change in the underprivileged community.

- Facilitated sessions for the catalysts that would cater to the development of 21st-century skills (ATC21S™ - Assessment and Teaching 21st Century Skills framework) and designed engaging virtual assessments and performance tasks to measure the project's impact.

ANJUMAN STUDENT LEADERS, Chennai

August 2019 to March 2020

Social-Emotional Learning Circle for the students in the Boys Hostel, Anjuman-E-Himayath-E-Islam, T.Nagar, Chennai.

- Co-created a Logical Model Framework with the school team of 4 Teach for India fellows to envision a positive school culture through Social, Emotional, and Ethical Learning.
- The pilot batch includes twenty-four students between grades three and eight to practise Social, Emotional, and Ethical Learning competencies developed by CASEL, Chicago, and Emory University.
- The project was transitioned to the hostel members by providing assisting tools and curriculum.

DYNAMIC WIRELESS POWER TRANSFER FOR AN ELECTRIC VEHICLE January 2018 to April 2018

- Created a dynamic wireless power transfer system using a toy car and an artificial track. The transmitter is laid on the track, and the receiver is placed on the bottom of the vehicle. The transmitter is energised intermittently with the vehicle's approach, and the motor is powered through the inductive coupling of the transmitter and receiver.

LEARNING FORUMS

Kolgai Public Policy Circle, Teach for India Chennai

September 2020 to April 2021

- Hypothesized solutions and created predictive models using *Python and R packages* to solve real-world problems with the available datasets taken from 'Our World In Data,' IMF, and the World Bank.
- Explored and utilised Bardach's Eightfold Path for policy analysis, developmental frameworks, and advanced Excel to develop statistical models.