

Sumegh Paltiwale

DATA ANALYST, RESEARCHER, TECHNOLOGIST, AND A FREE SOFTWARE ENTHUSIAST

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Education

Masters of Science, Computer Science (August 2015 to June 2017)

Department of Computer Science, University of Mumbai

Bachelor of Engineering, Instrumentation Engineering (October 2008 to May 2014)

Watumull Institute of Electronics Engineering and Computer Technology, Mumbai

Work Experience

Senior Research Associate and Co-investigator for Assessment of Google Solutions for Education CETE, Tata Institute of Social Sciences

October 2022 - till date

•Project Management

- Drafted the research proposals, and documentation for Assessment Google Solutions in Education Project at TISS in collaboration with Google India and Panl Pte Ltd
- Led the research and implementation activities across different states in India
- Coordinated between the stakeholders
- Designed the research tools for the data collection
- Conducted and led the data collection activities
- Led a cross-functional team of researchers, consultants, and data analysts over the course of the project.
- Oriented new researchers and consultants, providing orientation on project goals, research methodology, tools, and processes and assigned tasks and deliverables to team members based on skills and capacities.
- Tracked progress and provided guidance to help the team meet key milestones and deadlines and facilitated coordination between team members across different workstreams to ensure alignment.
- Coached and mentored junior team members, providing feedback to support development. Rigorously coached the team on using SPSS and MAXQDA for analysis of complex qualitative and quantitative data from the projects.

Data Management and Analysis

- Led the report drafting phase for AGSE Project
- Led the data-curation and analysis (qualitative as well as quantitative)
- Involved in research and analysis for UNICEF India-TISS project (CTLT) data
- Conducting training sessions for the usage of various research tools (for qualitative as well as quantitative research) for the CTLT project team as well as CETE research staff

Research Coordinator, CETE, Tata Institute of Social Sciences

August 2019 - October 2022

- Majorly involved with the ITE (Integrated approach to Technology in Education) project (winner of 2019 eNabling North East Development Award), seeded by Tata Trusts
- Involved in the development and maintenance of web-portals for the project
- Analytics of the LMS courses and corresponding activities on the OpenedX-based platform (TISSx)
- Developed content for free course on the usage of ICT in education
- Development of a browser-based plugin in JavaScript for text-mining of online CoPs (community of practice) (Analysing the WhatsApp data) presented at OCCE 2020 and SITE 2021 Conferences
- Data curation, Statistical analysis and reporting of the data (Baseline-Midline-Endline) from fields across various geographies in India (Using SPSS, R, and Python)
- In collaboration with Open University UK, Research and implementation of digital badges for e-learning platforms
- Development of the graphics for the project's research material and OCCE 2020 Conference (Conference Page Link)
- Part of the Local Organizing Committee (LOC) for the OCCE 2020 conference managing the technical aspect

Research Assistant, CEIAR (Now CETE), Tata Institute of Social Sciences

May 2017 - April 2019

- Development and maintenance of JavaScript-based plugins on Django/Python-based (gStudio) LMS and CMS
- Involved in authoring/maintaining and analytics of the data generated on Django/Python-based (gStudio)
- Involved in authoring/maintaining and analytics of the data generated on TISSx (edX-based) platform
- Management of the computer lab at TISS M-Power Public Learning center and conducting sessions for training free and Open Source softwares
- One of the initial members is the CLIX-ELeCT (CLIX-E-learning for Community Technology) initiative at TISS-M-power learning center at M-ward (Mumbai) where the digital literacy course is being run for underprivileged learners.
- Managing the communication channels for Mathematics teachers using various Communities of Practices and documentation of analytics.
- Facilitated the digital literacy course by teaching the usage of Free and Open Source tools. Also contributed in the development of teachers' courses for teaching using dynamic mathematics software
- Development and documentation of course content for the usage of ICT in Mathematics Education for students (Linear Equation, Geometric Reasoning, and Proportional Reasoning modules)
- Organizing and Facilitating TPD workshop on the usage of free and open-source technology in education for teachers in their classrooms in government schools in Rajasthan, Chattisgarh, Telangana, and Mizoram.
- Graphic designing (especially for posters) using Inkscape, GIMP, and other open-source tools

Visiting Faculty, University of Mumbai

December 2017

- Taught Python programming language for the Algorithms subject to first semester Masters's course students.

Visiting Student/Intern, Homi Bhabha Centre for Science Education, Tata Institute of Fundamental

Research

December 2016-March 2017

- Worked at Knowledge lab (<https://www.gnowledge.org/>), for migration of an existing open-source project, gStudio (Django/Python based) to a Neo4j-based platform.
- Work mainly involved the exploration of graphical databases and how graph-based computation can be considered an alternative approach to the traditional computing approach.

Implant Trainee, Bhabha Atomic Research Centre

June 2012-July 2012

- Worked on the development of an acoustic sensor circuit with a signal amplifier which could be useful for identifying the micro-vibrations and micro-cracks for safety purposes.

Invited Talks and Teachings

- Taught Algorithms and Python Programming to first-year MSc Computer Science students at Department of Computer Science, University of Mumbai.
- Conducted a one-day session at S. P. K. college, Sawantwadi on Algorithms and Introduction to Programming using Python.
- Digital literacy and usage of Free and Open Source Softwares (FOSS) at M-Power Center for mixed-age group learners.
- Conducted a one-day session on introduction to fundamentals of Graphical Databases and Neo4j to MSc students at the Department of Computer Science, University of Mumbai

Courses Developed

For Teachers On TISSx

- TOL01 - Technologies for Online Learning (Content and Analytics)
- S02 - Reflective Mathematics teaching using ICT (Content)
- C02 - Constructive Teaching and Learning using ICT (Analytics)

For Students on CLIXplatform

- Linear Equations (Content, management, and JavaScript tools development) • Proportional Reasoning (Content authoring)
- Geometric Reasoning (Content authoring)

Publications

Book Chapters

- Charania A, Paltiwale S, Bakshani U (2022). Integrated Approach to Technology in Education in India: Implementation and Impact. Taylor & Francis. Link: <https://doi.org/10.4324/9781003300274>

Journal Publications

- Charania A, Paltiwale S, Sen S, Sarkar D, Bakshani U. Leading Edge Use of Technology for Teacher Professional Development in Indian Schools. *Education Sciences*. 2023; 13(4):386.
- Charania, A., Bakshani, U., Paltiwale, S., Kaur, I., & Khan, N. N. (2021). Constructivist teaching and learning with technologies in the COVID-19 lockdown in Eastern India. *British Journal of*

Conference Proceedings and Presentations

- Paltiwale, S. & Charania, A. (2021). Understanding the teacher participation and interaction over technology-enabled CoP. In E. Langran & D. Rutledge (Eds.), Proceedings of SITE Interactive Conference (pp. 44-48). Online, United States: Association for the Advancement of Computing in Education (AACE).
- Paltiwale, S., Sarkar, D., & Charania, A. (2020, January). Use of Community of Practice for In-Service Government Teachers in Professional Development. In Open Conference on Computers in Education (pp. 73-77). Springer, Cham.
- (abstract) Dhakulkar A., Paltiwale S.(2019)raikhik samikaran ke adhigam ke liye sanvadatmak aur sahyogi vatavaran ka nirmaan(in Hindi), Central Intititueof Education, Delhi University (Presentation link)
- (abstract) Salgaonkar A., Paltiwale S. (2016). Neo4j: Entities and Relations are modeled as they are. Confluence of Emerging Trends in Multidisciplinary Research Areas to Mathematics (CETMRAM-2016), Mumbai

Posters

- Dhakulkar A., Paltiwale S.(2018). Designing An Interactive And Collaborative Environment For Learning Linear Equations, CLIX Symposium 2018, Tata Institute of Social Sciences, Mumbai

Engagement in Projects

MATPD (Multimodal Approach to Teacher Professional Development for South Asian Teacher Educators (SATE))

The project uses technology and professional learning communities to improve teacher quality in Afghanistan, Maldives, and Nepal.

Role:

- Involved in data analysis, creating analytics, and drafting the baseline-endline reports of the study

Constructive Teaching and Learning With Technology (CTLT) Collaborative Project Between CETE, TISS, and UNICEF (2022)

The program aims to build the capacity of 4,000 teachers and teacher educators across 10 states in the area of constructive teaching and learning with technology.

Role:

- Majorly involved in the research and analytics required in the project
- Trained the team about the usage of research and analysis softwares

TELTA-21, a collaborative project between Cete, Tiss, and Capgemini Foundation (2021-2022)

The project focuses on the effect of usage of ICT in government schools of Mumbai **Role:**

- Majorly involved in the research and analytics required in the project

Integrated Approach To Technology In Education (ITE), Supported By Tata Trusts(2017-2019)

ITE is a pedagogical framework to improve teaching and learning processes, and foster 21st-century skills and authentic, project-based learning for older children and adolescents in some of the most underprivileged geographies. ITE has been implemented in 12, mostly-rural locations in eastern and northern India. Students, most of them first-time computer users, deepen their learning of content by creating learning artifacts like weather charts, graphs representing jute production in India, or population-density charts in different cities. These projects are carefully selected to match the school curriculum and the lessons taught in class. **Role:**

- Majorly involved in the research and analytics required in the project

Digital Badges For TPD In India Project, Collaborative Initiative Between TISS And Open University Uk (2020)

Exchange initiative led by the Open University, UK working with partners at TISS, India. It seeks to explore the range of ways that digital badge technology could be used to support effective teaching practice in low-to medium-income teacher education by providing insight into the value and motivations that can be built around digital badges and the enablers and challenges to their use.

Role:

- Designed and developed the Digital Badges
- Exploration and deployment of the Badgr Platform (Mozilla's Digital Backpack platform)
- Majorly involved in the research and analytics required in the project

RTICT (Reflective Teaching In ICT) (2017 to 2020)

Involved in planning workshops for teachers and guiding them toward the usage of ICT in their curriculum and practices.

Role:

- Conducted teachers' training workshops for the usage of open-source technologies in their practices
- Involved in authoring and maintenance of the courses
- Involved in periodic reporting preliminary analytics and the findings

Connected Learning Initiative (CLIX), Collaborative Project led by TISS And MIT (2017-2019) •

Project Focused on Leveraging Open-source technologies for STEM education in Government Schools across rural as well as urban parts of the different states in India.

Role:

- Facilitating the implementation of the program
- Data collection via observations
- Authoring and maintenance of the content on the LMS

Learning Outcomes Map, Guided By Prof Ambuja Salgaonkar, HOD, Department Of Computer Science, University Of Mumbai And Prof G Nagarjuna, HBCSE-TIFR (May 2017) • As part of an internship during MSc, built using JavaScript and neo4j as backend. • Provides an interface for making nodes and adding their lineage

- The tool was aimed at developing concept maps as an attempt of employing a graphical database • Project at the Homi Bhabha Center for Science Education (HBCSE) and Tata Institute of Fundamental Research (TIFR)

- Link: <https://github.com/sumeghhp/lomap>

Low-Cost IR Spectrometer (May 2014)

- Developed as part of undergraduate final year project during BE
- The spectrometer used a low-cost web camera (without the IR filter) to capture the signals from the source
- The processing of the signal was carried out on a general-purpose computer using MATLAB **Acoustic Sensor for sensing micro-level vibrations. Guided By Mr. S Shetty, Scientific Officer, CNID, Bhabha Atomic Research Center**

Acoustic Sensor for sensing micro-level vibrations. Guided By Mr. S Shetty, Scientific Officer, CNID, Bhabha Atomic Research Center

- Studied and designed acoustic sensor as the objective of the implant training during undergraduate study at Bhabha Atomic Research Centre, Mumbai.

Certifications

Research Trends in Machine Learning and IoT (RTMI-2021) Crash Course on Python - 2021, Motilal Nehru National Institute Of Technology, Allahabad

Short Term Course (one-week) on Research Trends in ML and IoT

Crash Course On Python - 2021, Google (Coursera)

A crash-course on Python Programming Language

Computer Programming For Everyone - 2021, MOOC offered by Institute Of Coding, University Of Leeds

In this course, learners discovered how and why people program computers, the kinds of problems computers can solve, explored the different types of coding language and implemented the key principles learned in their coding project.

Geospatial Information Technology (GIT) in Fragile Contexts - 2021, MOOC offered by UNITAR (United Nations Institute For Training And Research)

The course was developed by the Operational Satellite Applications Programme (UNOSAT) of the United Nations Institute for Training and Research, (UNITAR) as part of the Earth Observation for Sustainable Development: Fragility, Conflict, and Security project funded by the European Space Agency. It aimed to give a short but practical introduction to GIT in states affected by fragility, with a focus on remote sensing.

Blockchain Basics - 2020, MOOC offered by University At Buffalo (Coursera)

Course intended to help recognize foundational concepts of blockchain, and apply these program concepts on the blockchain.

Skills

Languages: Python, LISP, JavaScript, HTML, CSS, SQL

Databases: Neo4j (Graphical), MySQL (Relational), MongoDB (document-oriented)

Data Analysis: SPSS, R, Tableau, Power BI

Familiar Technologies: JSON, RDF, OWL, Git, Blockchain

CMS/LMS: edX, gStudio (GNOWSYS Studio), WordPress, Moodle

Graphic Designing: Inkscape, GIMP

Professional Memberships

- International Federation for Information Processing (IFIP) - Technical Committee 3 (corresponding member since 2020)
- Indian Mathematical Society (Life member since 2022)
- Cryptology Research Society of India (Life member since 2022)