

# Mohit Mittal

Data Scientist, Ph.D

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## Overview

Data Scientist with a Ph.D. in Computer Science and over 7 years of experience in AI, machine learning, and statistical analysis. Proficient in designing scalable predictive models, explainable AI frameworks, and end-to-end data pipelines. Proven expertise in Python, TensorFlow, and cloud platforms like Azure. Strong track record in leading cross-functional teams, delivering actionable insights, and managing complex AI projects. Published 1400+ citations, blending research and practical applications to drive business impact.

## Experience

2022-Present **Data Scientist**, Shiratech Knowtion GmbH, Karlsruhe, Germany

### [1] TWK PROJECT

- **Project Scope:** STM32 microcontroller-based project involving 32 team members, working on three separate products.
- **Role and Responsibilities:**
  - Actively contributed to **requirements gathering** and **software development**.
  - Automated documentation workflows by developing a Python-based tool for parsing Jira data, increasing team productivity by 30%.
  - Held a team managing position, responsible for
    - **Managing daily meetings** to track progress and set team objectives.
    - Overseeing the **Kanban board** for efficient task assignment and workflow management.
    - A small team to coordinate daily tasks, ensure on-time deliverables, and resolve any roadblocks.

### [2] QIV PROJECT

- **Project Scope:** Machine learning-based analysis of train information using survey data.
- **Role and Responsibilities:**
  - Full project management from inception to completion, ensuring that all aspects of the project aligned with the goals and deadlines.
  - Led the development of machine learning models to process and analyze survey data effectively.
  - Served as the **lead coder**, responsible for implementing key components of the data analysis and machine learning pipeline.
  - Acted as the **primary presenter**, communicating progress, results, and findings to stakeholders and higher management.
  - Coordinated the efforts of team members to ensure smooth collaboration and integration of all project aspects.

### [3] PROFI-WIND PROJECT

- **Project Scope:** AI-based project aimed at predicting physical faults in windmill blades.
- **Project Scale:** Collaborative effort involving multiple technology companies and universities.
- **Role and Responsibilities:**
  - Developed and deployed a CNN framework to predict windmill blade faults, reducing maintenance downtime by 25%.
  - Enhanced model interpretability by implementing explainable AI techniques, increasing stakeholder trust in predictions.
  - Collaborated with academic and industry partners to align the solution with research and commercial goals.

2020–2022 **Postdoctoral Researcher**, INRIA, Lille, France

(2 years) **PROJECT TITLE: Inspecting and Debugging Visual Question Answering Systems via Post-hoc Explanations**

- **Project Scope:**
  - **Objective:** To provide detailed insights into the prediction process of a Visual Question Answering (VQA) system, enabling end-users to understand how the system makes its predictions.
  - **Key focus:**
    - Breaking down the prediction into individual components and explaining their contributions.
    - Enhancing the transparency of the VQA system by offering an explanation of the deep neural network's decision-making process.
- **Role and Responsibilities:**
  - Tackled the challenge of explainability in deep neural networks, which is known to be a complex task due to the black-box nature of these models.
  - Employed machine learning approaches to generate post-hoc explanations for predictions made by the VQA system.
  - Ensured that the explainability process could reveal the inside story of the prediction to the user, making it comprehensible to non-experts.
  - Worked on techniques that clarified the contributions of individual components in the neural network to provide meaningful, actionable insights.

2019–2020 **Postdoctoral Researcher**, *Kyoto Sangyo University*, Kyoto, Japan

(1 & half year) **PROJECT TITLE: Accurate Social Media Mapping with Physical Location**

- **Project Scope:**
  - **Objective:** To improve the accuracy of geo-tagged data from social media, which is often too imprecise for microscale analysis.
  - **Key focus:**
    - Enhancing the utility of social media data for detailed geographical analysis, such as at the street level or for specific places of interest (POI).
    - Ensuring that social media data could be reliably matched with specific physical locations.
- **Role and Responsibilities:**
  - Addressed the **limitations of geo-tagged data**, which frequently restricts its usefulness in location-based studies due to inaccuracies.
  - Conducted a study to demonstrate how **social media data** can be aligned with precise physical locations, improving its application for microscale analysis.
  - Employed **geospatial analysis techniques** to match social media posts with accurate geographic coordinates.
  - Explored methods to **correct and refine location data**, providing a more reliable dataset for researchers and urban planners focusing on location-specific insights.

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## Education

2012–2018 **PhD**, *Computer Science*, Gurukul Kangri University, India

2010–2011 **Master of Technology**, *Computer Science and Engineering*, Guru Nanak Dev University, India

2006–2010 **Bachelor of Technology**, *Computer Science and Engineering*, Guru Nanak Dev University, India

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## Technical Skills

- **Generative AI**
  - Large language model, ChatBot, OpenAI
  - Natural language programming
- **Deep learning and Machine Learning**
  - Predictive Modeling, Regression, Classification, CNNs (VGG16, VGG19)
  - Explainable AI Frameworks, Deep Learning Optimization, Model Deployment
- **Programming & Tools**
  - Python, C, C++, SQL, NoSQL, PySpark
  - TensorFlow, PyTorch, Scikit-learn, Numpy, Pandas
  - GitLab, Git

- **Cloud Platforms**
  - Azure (Databricks, End-to-End Lakehouse), Docker, DevOps
- **Data Science Expertise**
  - Data Cleaning, Feature Engineering, Statistical Analysis, Data Visualization (Power BI)
- **Project Management**
  - Agile Methodologies, Kanban board

## Certifications

- Microcontroller Embedded C Programming, Udemy, 28 June 2024
- Master Microcontroller and Embedded Driver Development, Udemy, 28 September 2024

## Research Publications

- [C1] M.Mittal, P.Siriaraya, C.Lee, Y.Kawai, T.Yoshikawa and S.Shimojo, **“Accurate Spatial Mapping of Social Media with Physical Locations”**, IEEE BSD, Big Data, Los Angeles, USA, 9-12 Dec 2019.
- [C2] P.Siriaraya, Y.Zhang, Y.Wang , Y.Kawai, M.Mittal, P.Jeszenszky and A.Jatowt, **“Witnessing Crime through Tweets: A Crime Investigation Tool based on Social Media”**, 27th ACM SIGSPATIAL, Chicago, Illinois, USA, 5-8 Nov 2019.
- [C3] T. Omura, K. Suzuki, P. Siriaraya, M. Mittal, Y. Kawai, and S. Nakajima **“Ad Recommendation utilizing user behavior in the physical space to represent their latent interest”**, IEEE International Workshop on Big Spatial Data (BSD 2020),USA.
- [C4] Y.Wang, P.Siriaraya, M.Mittal, H. Xie and Y.Kawai **“Understanding Multilingual Correlation of Geo-tagged Tweets for POI Recommendation”**, W2GIS,2020, China
- [C5] T.Kiri, M.Mittal, P.Siriaraya , Y.Kawai and S.Nakajima, **“Development of an Acoustic AR Gamification System to Support Physical Exercise”**, ACM Multimedia, Nice, France, Oct 21-25, 2019.

## Workshops

- 2020 Participated in a online workshop on “Recent Trends in Computer Science & IT”, Raj Kumar Goel Institute of Technology, Ghaziabad, India, from 13th Jul 2020 to 17th Jul 2020
- 2019 Completed e-Learning Course on “Research Ethics”, Japan Society for the Promotion of Science.
- 2018 Participated in a workshop on “Machine Learning and Data Analytics with Python”, at Ajay Kumar Garg Engineering College, Ghaziabad, India, from 4th Dec 2018 to 08th Dec 2018.
- 2017 Participated in a workshop on “Big Data”, at Graphic Era University, Dehradun, India, from 18th Dec 2017 to 23rd Dec 2017.
- 2017 Participated in a workshop on “Practical Hands on Machine Learning”, at Inmantac Institutes, Ghaziabad, India, from 6th July 2017 to 10th July 2017.

## Personal Information

Date of Birth – 02, May 1988.

Languages Known - English, Hindi

Nationality – Indian.

VISA- Holding EU Blue Card visa in Germany.

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PERSONAL Website-<https://mohitmittal1988.github.io/mm/>