

# Tushar Semwal

Senior Applied Scientist, PhD

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**PROFESSIONAL SUMMARY** Applied Scientist and E2E ML engineer with 7+ years of post-PhD experience in Knowledge Graphs, NLP, Large Language Models, and personalized recommendations. Daily tasks involve LLM custom re-training, fine-tuning on specific domains, and agent systems along with proven success in the deployment of scalable NLP solutions. Currently leading Data Science and AI initiatives at Presight, an ADX-listed AI and decision intelligence company (part of G42). Skilled at delivering customer-focused AI products, bridging research and production, and meeting enterprise needs in fast-paced environments.

**CORE SKILLS**

**Programming & NLP Technologies:** LoRA fine-tuning, Knowledge Graphs, LLM training, RAG, Graph-RAG, Task planning and execution through LLM agent development, Python, Multi-modal applications, PyTorch, TensorFlow, HuggingFace libraries, SQL, PySpark, Reinforcement learning, Recommendation Algorithms, Personalization Models, Federated Learning

**Machine Learning & Data Science:** Azure Machine Learning, Large-Scale Data Processing, Graph Algorithms

**Enterprise Model Deployment & Scalability:** Docker, CI/CD, Azure, Git, MLOps (Machine Learning Operations)

**Product Lifecycle & Client Engagement:** End-to-End AI Solution Design, Customer-Centric Problem-Solving, Agile Development

**Natural Languages:** English (fluency), Hindi (native)

**EXPERIENCE**

**Lead Data Scientist @ Presight (Abu Dhabi, UAE)** *03/2026 – Present*

- Leading Data Science and AI team on agentic systems, multi-agent orchestration, and LLM-based tool development across multiple domains including Legal, Authorities, Energy, and commercial sectors.
- Architecting and researching advanced AI solutions leveraging RAG, multi-agent frameworks, knowledge graphs, and function calling for complex domain-specific reasoning and automation.
- Driving technical strategy on API-first architectures, hybrid AI systems, and agent-backend integration patterns to balance service ownership with AI reasoning capabilities.

**Senior Applied Scientist @ UNEY (Dubai, UAE)** *07/2025 – 03/2026*

- Led the privacy-first AI charter to build trustworthy, secure, and regulation-compliant AI products.
- Drove initiatives on ethical data usage, fairness, and explainability across deployed ML systems.
- Mentored applied scientists and data engineers on scalable ML architectures and evaluation methodologies.

**Principal Applied Scientist @ Microsoft (Hyderabad, India)** *05/2021 – 07/2025*

- Led development and deployment of a trending document recommendation system within an enterprise Knowledge Graph with domain-specific ontologies increasing user engagement by 6%.
- Customized LLMs to meet client-specific needs by fine-tuning and RAG methods enhancing model responsiveness and accuracy in dynamic enterprise environments.
- Worked closely with client-facing teams to adapt and deploy scalable LLM models, leading to a 15% reduction in time-to-deployment for customer solutions.
- Managed cross-functional teams on NLP and personalization projects, including tooling that accelerated recommendation system deployments by 9%.

**Machine Learning Scientist @ Mobius Labs GmbH (Berlin, Germany)** *01/2021 – 05/2021*

- Developed a federated shopping recommendation pipeline approved by German research and funding organizations, boosting personalization in the recommendation flow.

**Research Associate [Energy Sector] @ The University of Edinburgh (Edinburgh, UK)** *01/2019 –*

01/2021

- Multi-modal prognostic ML solutions for Offshore energy industries including Wind, and Oil and Gas.
- Deployment in industrial on-site projects [orcahub.org].

**Research Scientist @ OpenMined** (Open source contributor, Remote) 03/2020 – 01/2021

- Directed a team of research engineers on federated learning for personalized recommendations, resulting in 2 publications.
- Developer for famous PySyft library.
- Author of trending ☆ 400+ GitHub repo: [awesome-federated-computing](#).

**Research Intern @ Bixby Team, Samsung Research Institute (Bengaluru)** 06/2017 – 09/2017

- Developed Transfer Learning technique for Text Classification using CNN.
- Published a research paper in SIAM SDM-18, a top-tier data mining conference.

## EDUCATION

**PhD - Distributed Machine Learning**, Indian Institute of Technology (IIT) Guwahati 2015 – 2019

**MTech - Computer Science and Engineering**, Indian Institute of Technology (IIT) Guwahati 2013 – 2015

**BTech - Electronics and Telecommunication Engineering**, College of Engineering Roorkee 2009 – 2013

## PROJECTS

**Interest Profiling Using RAG and NLP on Document Content**

- Led the design and implementation of a Retrieval-Augmented Generation (RAG) pipeline to analyze and understand user interests based on enterprise Word document content.
- Provided personalized content recommendations by leveraging both retrieval and generative NLP approaches to extract, rank, and summarize relevant information within a large corpus of documents.

**Rapid Development to Deployment for LLM-based Solutions**

- Led customer-focused initiatives to deliver rapid prototyping and high-velocity experimentation on LLMs, achieving a 25% reduction in time-to-market for client-specific AI solutions. Gained deep familiarity with fine-tuning and optimizing LLMs for diverse enterprise applications.

## AWARDS

**Coverage in a leading Scottish newspaper**, for applied ML work on public safety, showcasing expertise in model deployment for industrial applications. 2022

**Covid-19 Medal Award** from the University of Edinburgh. 2022

**Microsoft Global Hackathon Winner**, winner in international and local country regions. 2022

**TCS Research Fellowship**, a national industrial award for applied research. 2015 – 2019

**Microsoft Travel Grant**, to present work at SDM 2018 conference in San Diego. 2018

**DST SERB Travel Grant** for SDM 2018. 2018

**Travel Grant** for AAMAS Summer School on Multi-Agent Systems. 2016

## TALKS

**Graph-powered Recommendations in Enterprises**, invited talk at IIIT Hyderabad, September 2024.

**Graph Representation Learning**, invited tutorial at LBRCE college, October 2023.

**Graph Federated Learning**, invited tutorial at IIIT Hyderabad to both the faculties and students, June 2023.

**Privacy-Aware Machine Learning**, invited guest lecture at University of Petroleum and Energy Studies (UPES), March 2020.

**Sensing and Robotics Opportunities in Offshore Industries**, invited talk at The student conference on The Future of Intelligent Sensing and Measurement, October 2019.

PROJECT  
GRANTS

- *Lead applicant and Co-Investigator* for the project titled: “Analysing Public Sentiments and Opinion about 20mph speed restrictions in Edinburgh and Belfast using Twitter Data”. Award: £1000 by Wellcome Trust. (01 Sept 2020 – 31 Dec 2020)

SELECTED  
PUBLICATIONS

- [1] T. Semwal, H. Wang, and C. K. T. Reddy. **Selective Federated Transfer Learning using Representation Similarity**. (2020). In NeurIPS 2020 workshop SpicyFL.
- [2] T. Semwal, G. Mathur, P. Yenigalla, and S. B. Nair. **A Practitioners’ Guide to Transfer Learning for Text Classification using Convolutional Neural Networks**. In Proceedings of SIAM Conference on Data Mining (SDM) 2018.
- [3] T. Semwal, S. S. Jha, and S. B. Nair. **On Ordering Multi-Robot Task Executions within a Cyber Physical System**. ACM Transactions on Autonomous and Adaptive Systems (ACM TAAS).

Please visit my [[Google Scholar](#)] profile for full set of publications.