

Venkatesh Kone

CONTACT INFORMATION	Address: Vijayawada, Andhra Pradesh, India ✉ : venkateshkone.connect@gmail.com Web: konevenkatesh.github.io	☎ : +91 7893646449 LinkedIn: linkedin.com/in/venkatesh-kone Google Scholar: Venkatesh Kone Profile
PROFESSIONAL SUMMARY	A researcher and educator with four years of teaching experience and interdisciplinary expertise in both Civil Engineering (BIM Technology) and Computer Science. My research focuses on developing applied AI solutions for knowledge management, including the creation of novel ontologies, web platforms, and Retrieval-Augmented Generation (RAG) applications for the construction sector. I am seeking a challenging role to further contribute to research in Applied AI, Data Science, and Digital Twins.	
RESEARCH INTERESTS	• Applied AI, LLMs Agentic RAG Systems • Knowledge Management Systems Ontology Engineering • Building Information Modeling (BIM) Digital Twins • Predictive Analytics Graph Neural Networks (GNNs) • Natural Language Processing (NLP) Semantic Search • Data Interoperability Semantic Web	
TECHNICAL SKILLS	• Programming Languages: Python, JavaScript • AI/ML Libraries: Scikit-learn, Pandas, NumPy, PyTorch • Knowledge Graph & Semantic Web: RDFlib, Apache Jena Fuseki, SPARQL, Turtle (.ttl), Owlready2 • Web Development & Data Visualization: Flask, FastAPI, Streamlit • AI Services & Tools: IBM watsonx Orchestrate, LangChain, LangGraph, CrewAI, AutoGen2, Jupyter, Git, Protégé • AEC, BIM & Digital Twin: Revit, NavisWorks, CIVIL3D, InfraWorks, ifcopenshell, QGIS, TwinMotion, Unreal Engine, Cesium	
RESEARCH EXPERIENCE PH.D (2020-25)	Doctoral Researcher — National Institute of Technology Karnataka • Engineered the "IproK (Integrated Project Knowledge)" ontology, a novel semantic model for integrating construction project data (Schedule, Cost, Resources). • Developed an ontology-based data management web application for project creation, planning (scheduling, resource assignment, cost estimation), and interactive dashboard visualization. • Developed a Graph Neural Network (GNN) based model for predictive analytics, identifying task-level risks of delay and cost overruns from project knowledge graphs. • Built "ChatGraphDB," an LLM-powered system that transforms native IFC (BIM) models into an ontology (Knowledge Graph) and enables querying via natural language.	
TEACHING EXPERIENCE (2017-20)	Assistant Professor — KL University, Vijayawada • Taught and designed curriculum for undergraduate courses in the Department of Civil Engineering. • Integrated data analysis and project management software (Primavera, MS Project) into coursework. • Mentored numerous B.Tech and M.Tech final year projects, guiding students in applying computational methods to engineering problems. • Supervised multiple M.Tech student research projects that resulted in peer-reviewed publications in journals and conference proceedings.	
SELECTED PUBLICATIONS	• Kone, V., & Mahesh, G. (2025). The IproK ontology: a unified approach to managing construction project information. <i>International Journal of Construction Management</i>, 1–30. DOI: 10.1080/15623599.2025.2562105 • Kone, V., & Mahesh, G. (2025). An Ontology-Driven Bi-Directional Workflow for Integrating Project Management Data into The IFC Standard. <i>Journal of Information Technology in Construction</i>, ISSN 1874-4753. Accepted	

- Kone, V., & Mahesh, G. (2025). Ontology-Driven Project Management: A Framework for Structured Data and Automation. *Proceedings of Digital Frontiers in Buildings and Infrastructure International Conference Series*, 77-88. Link: dfbi.org
- Kone, V., Mahesh, G., & Ingle, P.V. (2023). Enhancing Knowledge Management in the Construction Industry: Exploring the Impact of Semantic Web Technologies. In: Kashyap, A., et al. (eds) *Advances in Construction Management. ICCRIP 2023. Lecture Notes in Civil Engineering, vol 601*. Springer, Singapore. DOI: 10.1007/978-981-96-4902-0_14
- Pujitha, K.S.V.S., & Kone, V. (2020). Forecasting the construction cost by using unit based estimation model. *Materials Today: Proceedings*, 33(Part 1), 613-619. DOI: 10.1016/j.matpr.2020.05.546
- Chilamkuri, K., & Kone, V. (2020). Monitoring of varadhi road bridge using accelerometer sensor. *Materials Today: Proceedings*, 33(Part 1), 367-371. DOI: 10.1016/j.matpr.2020.04.159
- Tirunagari, H. V., & Kone, V. (2019). Simulation of Construction Sequence using BIM 4d Techniques. *International Journal of Recent Technology and Engineering (IJRTE)*, 7(6C2). Link: PDF via ResearchGate
- Reddy, H. G., & Kone, V. (2019). Study on Implementing Smart Construction with Various Applications Using Internet of Things Techniques. *International Journal of Recent Technology and Engineering (IJRTE)*, 7(6C2). Link: PDF via ResearchGate

(A complete list of publications is available on Google Scholar)

RESEARCH & APPLIED PROJECTS

Doctoral Research Projects

Ontology-Driven Bi-Directional Workflow for BIM/IFC Integration

- Architected a novel bi-directional workflow to integrate project management data (from the IproK ontology) with building data (from the IFC standard).
- Developed and registered the IproK ontology (w3id.org/iprok/) and created a Python-based process to programmatically generate new, enriched IFC models from the unified knowledge graph.
- Bridged the critical information gap between project management systems and BIM models, ensuring data consistency and standards-compliance.
- **GitHub:** github.com/konevenkatesh/Semantic-BIM-Workflow

Web Application for Project Data Management

- Developed a web-based application to serve as a user interface for the IproK ontology.
- Built the application using Streamlit for the frontend, with Owlready2 for ontology manipulation, NetworkX for graph operations, and various data visualization libraries.
- Allowed non-technical project managers to easily manage, visualize, and interact with integrated construction data in real-time.
- **Demo Link:** lnkd.in/g/PQ4GETz
- **GitHub:** github.com/VenkateshKone-1/Iprok-web.git

ChatGraphDB: LLM-Powered Conversational Interface for Knowledge Graphs

- Developed "ChatGraphDB," a conversational AI interface for querying project knowledge graphs using natural language.
- Built a dual-web-application framework using Streamlit and fine-tuned GPT-4 with ontology-aware prompts to translate questions into SPARQL queries (achieving 82.5% accuracy).
- Empowered non-technical users to intuitively interrogate complex project data without needing to write code, making data more accessible.
- **GitHub:** github.com/konevenkatesh/ChatGraphDB

Predictive Analytics for Project Control using Graph Neural Networks (GNNs)

- Created a predictive model to forecast task-level delay and cost-overrun risks in construction projects.
- Engineered temporal, resource, and cost features from the IproK knowledge graph and used this data to train Graph Neural Network (GNN) models.
- Moved from reactive to proactive project control by identifying complex risk patterns before they impact the schedule or budget.
- **GitHub:** github.com/konevenkatesh/GNN-Project-Control

Applied & Personal Projects

A.U.R.A.: AI Urban Reporting Agent for Smart Cities

- Architected "A.U.R.A." (Amaravati Urban Resilience Agent), a collaborative multi-agent AI system for smart city data.
- Utilized IBM watsonx Orchestrate for agent collaboration and developed a custom data pipeline using QGIS and a new ontology (ADTO) to convert geospatial data into an RDF knowledge graph.
- Enabled intelligent, high-level querying of complex, interconnected urban infrastructure data for better decision-making.
- **GitHub:** github.com/konevenkatesh/IBM_TechXchange_2025_Aegis-Roads.git

BIM 3D Model for NITK Campus Reservoir

- Developed a detailed 3D Conceptual Plan for the NITK Surathkal campus reservoir.
- Created the model and visualizations using a suite of BIM and rendering tools, including AutoDesk InfraWorks, Revit, Blender, and Twinmotion.
- Facilitated clear visual communication with stakeholders and accelerated the design review and approval process.
- **GitHub:** github.com/konevenkatesh/BIM-NITK-Reservoir

BIM Application Development (Open Source)

- Built a custom, open-source application for viewing and analyzing BIM models.
- Developed the application using the 'That Open Company' (TOC) stack, focusing on open-source libraries for interoperable data handling.
- Created a flexible tool for BIM analysis outside of proprietary software ecosystems and promoted open-data standards.
- **GitHub:** github.com/konevenkatesh/TOC-BIM-Application

Multimodal Agentic RAG for Construction Contracts

- Developing an agentic Retrieval-Augmented Generation (RAG) system for querying multimodal construction documents.
- The system architecture combines Docling, an ontology, Graphiti, a Vector DB, and a custom AgenticRAG flow.
- Enables accurate, context-aware retrieval from complex documents like contracts, tenders, and reports, which contain text, diagrams, and tables.
- **GitHub:** github.com/konevenkatesh/tender_agproject

Future Research Concepts

Digital Twin of Amaravathi with A.U.R.A. Integration

- A large-scale, high-fidelity digital twin of the city of Amaravathi.
- Planned for development using Unreal Engine for physics-based simulation, Cesium for lightweight 3D tiles, and an AI Assistant for conversational interaction.
- Intended to create a comprehensive urban systems model that can be queried and analyzed in real-time via the A.U.R.A. intelligent agent.
- **GitHub:** github.com/konevenkatesh/SmartCity-Amaravathi-DT

ATLAS: Local Voice Assistant for Project Management

- "ATLAS," an on-device, local-first, multilingual (Telugu/English) voice assistant for construction knowledge management.
- Proposing an architecture using advanced STT/TTS models (e.g., Whisper, ViTs) to ensure privacy and offline functionality.
- Aims to enable hands-free, real-time project monitoring, data entry, and status updates directly on construction sites where connectivity is limited.
- **GitHub:** github.com/konevenkatesh/Local-PM-Voice-Agent

EDUCATION	National Institute of Technology Karnataka, Surathkal, India Ph.D. in Civil Engineering (Specialization in Knowledge Management AI) CPI: 8.75	2020 - Present
	Visvesvaraya National Institute of Technology, Nagpur, India M.Tech in Construction Technology Management CPI: 7.19	2015 - 2017
	J. B. Institute of Engineering and Technology (Affiliated to Jawaharlal Nehru Technological University Hyderabad), India B.Tech in Civil Engineering Percent Marks: 74.10%	2010 - 2014
AWARDS AND SCHOLARSHIPS	• 2015-2017, Scholarship for postgraduate study at the Department of Civil Engineering, VNIT Nagpur awarded by Department of Human Resource and Development, Govt. of India. • 2020-2025, Scholarship for pursuing research study at the Department of Civil Engineering, NIT-Karnataka, awarded by Department of Human Resource and Development, Govt. of India.	
CERTIFICATIONS	• IBM RAG and Agentic AI: Build Next-Gen AI Systems Professional Certificate Issued by: IBM (via Coursera) Verification: https://coursera.org/verify/professional-cert/GGXH2B9LNRYL • Building AI Agents and Agentic Workflows Specialization Certificate Issued by: IBM (via Coursera) Verification: https://coursera.org/verify/specialization/6N17YPAB1KO2 • BIM Fundamentals for Engineers Issued by: National Taiwan University (via Coursera) Verification: coursera.org/verify/WJRUR5A9AUJ6 • Foundations of Project Management Issued by: Google (via Coursera) Verification: coursera.org/verify/WJRUR5A9AUJ6	
REFERENCES	• Dr. Gangadhar Mahesh, Professor, National Institute of Technology Karnataka, Surathkal, India Email: gmahesh@nitk.edu.in • Dr. Deepak M.D., Assistant Professor, National Institute of Technology Warangal, India Email: deepakmd@nitw.ac.in	
DECLARATION	I hereby declare that all information furnished above are true, complete and correct to the best of my knowledge and belief.	
	Date: 30-11-2025 Place: Vijayawada	Venkatesh Kone