Omsri Kumar Aeddula,
Industrial Researcher | Applied AI Engineer

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PROFILE	7+ years of experience as an applied researcher and engineer, leading cross-functional teams to innovate and achieve breakthroughs in AI, Signal Processing, Computer Vision, and Robotics.

- Passionate about utilizing AI for real-world challenges in industries like manufacturing, automotive, and transportation.
- Deep expertise in cutting-edge AI techniques (ML & Deep Learning) for impactful results.
- Proven ability to manage projects, lead teams, and communicate complex technical concepts effectively.
- Strong problem-solving and analytical skills for delivering measurable results.

PROFESSIONAL EXPERIENCE

Mar 23- Present   **Applied AI Engineer, STICKYBITS**   Sweden

- **Led groundbreaking E-production AI initiative**: Developed new scanning stations using Keras, TensorFlow, PyTorch, and Scikit-learn to create image datasets for seamless integration of AI solutions into the E-production workflow (collaboration across teams).

Dec 21- Present   **Industrial Researcher, Product Development Research Laboratory**   Sweden

- Leading a Ph.D. project on AI for product development (Product Service Systems). My research focuses on applying machine learning, deep learning, and computer vision to develop innovative AI solutions for autonomous machines and medical applications. Contribute to scientific advancements and present findings at conferences.

Dec 21- Feb 24   **Vice-Chairman of Ph.D. Committee, BTH**   Sweden

- Advocated for student needs, contributed to improving Ph.D. education, and showcased leadership, communication, and organizational skills.

Jan 17- Dec 21   **Researcher, Product Development Research Laboratory**   Sweden

- Developed and presented innovative prototypes of autonomous machines at global events (expos & conferences), leveraging expertise in computer vision, image processing, and machine learning. Collaborated effectively with cross-functional teams to achieve successful results.

EDUCATION

Ph.D. with emphasis on AI
Blekinge Institute of Technology, Sweden

M.Sc. with emphasis on Signal Processing
Blekinge Institute of Technology, Sweden

SKILLS

Skill	Level	Skill	Level	Skill	Level
Artificial Intelligence	E	Machine Learning	E	Deep Learning	E
Computer Vision	E	OpenCV	E	NLP	P
Python	E	MATLAB	E	C++	I
Data-Visualization	E	Big Data	E	LLM	I
ML Frameworks	P	GIT	P	Collaboration	E
Problem-Solver	E	Communication	E	Leadership	E

E Expert   I Intermediate   P Proficient   B Beginner

ACHIEVEMENTS

- IBM AI Engineering Specialization Certification.
- Awarded the maximum 75% (Maximum) for excellent academic performance.
- Published several papers in leading academic journals and conferences.
- Contributed to the scientific community as part of KKS (KK-Stiftelsen) research.

RELEVANT RESEARCH PROJECTS

Revolutionizing Transportation

VOLVO Group — **ASPECT: A System for Electric and Connected Transport Solutions**

- Developed AI solutions using vision-based models to understand autonomous system behavior, enabling enhanced decision-making and support for PSS offerings (Product-Service Systems) in the electric and connected vehicle space.
- Leveraged diverse sensor data to build predictive maintenance models, proactively identifying and mitigating potential maintenance issues before they occur, improving operational efficiency and safety.
- Collaborated cross-functionally with stakeholders across various departments to create a scalable solution integrating automotive and digital technologies, ensuring seamless integration and potential for future growth.

VOLVO CE — **Scale Autonomous Machine Development: Phase – I and II**

- Developed a functional autonomous machine prototype using AI and computer vision. Also developed a mobile application for site operations.
- Implemented OpenCV, Python, and AI for predictive maintenance strategies, improving decision-making.
- Showcased the prototype globally (USA, India, China), demonstrating effective cross-cultural collaboration and impactful presentations.

KKS Profile — **Model-Driven Decision Arena - Data Analysis**

- Played a key role in developing the 'Decision Arena' using deep learning, regression models, and advanced statistics.
- Implemented AI algorithms for cause-and-effect analysis in design exploration studies, fostering a collaborative model-based environment.
- Successfully tested the model with complex datasets, showcasing adaptability and problem-solving skills.

Optimizing Efficiency & Safety

STANFORD & BTH — **Real-Time Human Detection Using Deep Learning**

- Implemented deep learning algorithms for real-time human detection, achieving 98.32% accuracy.
- Optimized the model for real-time performance, ensuring its suitability for resource-constrained environments in construction and mining sites.
- Demonstrated scalability in designing solutions for internet-scale operation, aligning with job requirements.

VOLVO CE — **ZEUX - Robotic Autonomous Machine for Human Safety**

- Led the development of a functional prototype with AI for human detection and tracking in construction/mining environments.
- Implemented state-of-the-art AI algorithms for safety categorization, reducing accident risks.

- Applied machine learning and computer vision for real-time safety assessment, contributing to decision-making in Product Service System (PSS) development.

Volvo CE   **Transforming Construction Efficiency with AI and Chatbot**

- Developed a novel AI-powered system for construction equipment that leverages Digital Twin technology and a Chatbot for real-time monitoring and proactive maintenance.
- Implemented machine learning algorithms to analyze sensor data and predict potential equipment failures, minimizing downtime and optimizing performance.
- Designed a user-friendly Chatbot to provide real-time support to construction personnel, improving communication and troubleshooting efficiency.

Shaping the Future of Manufacturing

VOLVO CARS   **ISTAMP- Digital Twin of Automotive Components**

- Developed a digital twin of the Volvo XC90 inner door panel manufacturing process using Artificial Intelligence.
- Enabled the model to account for variations in material properties, improving efficiency and sustainability.
- Contributed to the development of a new technology for sustainable automotive manufacturing.

BMW   **E-PRODUCTION: Enhancing Production Efficiency**

- Led a company-wide AI initiative to transition to E-production.
- Built robust deep learning models (Keras, TensorFlow, PyTorch) for accurate motorcycle part detection (including screws).
- Developed a cutting-edge scanning station and software architecture for automatic detection, tracking, and bill-of-materials generation, showcasing expertise in computer vision and AI.

At the Forefront of Healthcare Innovation

Region Blekinge   **BAIAA (Blekinge Artificial Intelligence study on Age Assessment)**

- Pioneered a deep learning model for age assessment with 97.63% accuracy for growth zones using MRI images and CNNs.
- Developed a non-invasive and objective method for age assessment, potentially reducing bias and improving consistency in clinical and legal settings.
- Published groundbreaking research, contributing to the advancement of AI-driven age assessment for clinical and legal applications.

Region Blekinge   **E-DENT: New Technical Devices for Better Oral Health for Older People**

- Led a project to utilize digital technologies for improving oral health in the elderly.
- Built a robust decision support system for Oral hygiene using NLP.
- Published research on powered toothbrushes and mobile health apps for data collection and monitoring, showcasing a commitment to impactful healthcare technology research.

Combating Global Challenges

BTH   **Aspect Mining of COVID-19 Outbreak with SVM and NaiveBayes Techniques**

- Developed an AI system using machine learning (SVM & Naive Bayes) to classify COVID-19 tweets (positive, negative, neutral) in real-time, enabling sentiment analysis of public opinion during the outbreak.

- Identified trends and patterns in social media data during a critical public health crisis, providing valuable insights for public health interventions.
- Contributed to the development of new public health surveillance technologies for monitoring and analyzing public sentiment during future outbreaks.

Pushing Boundaries in Innovation

BTH **Design of Smart Toothbrush: For Cause-and-Effect Studies**

- Developed a smart toothbrush prototype incorporating temperature sensors, leveraging machine learning to analyze Basal Body Temperature (BBT) for potential ovulation detection.
- Designed and integrated temperature sensors onto the toothbrush to ensure optimal user comfort and data accuracy, considering both usability and functionality.
- Explored the potential of this novel approach for non-invasive ovulation monitoring, contributing to the advancement of women's health technology.

PUBLICATIONS

- **Aeddula, O.**, Ruvald, R., Wall, J., Larsson, T. "AI-Driven Comprehension of Autonomous Construction Equipment Behavior for Improved PSS Development", Proceedings of the 57th Hawaii International Conference on System Sciences. 2024. https://hdl.handle.net/10125/106500
- **Aeddula, Omsri**., Martin, Frank., Ruvald, Ryan., Askling Christian., Wall, Johan., Larsson, Tobias. "AI-Driven Predictive Maintenance for Autonomous Vehicles for Product-Service System Development", Procedia CIRP.
- Machchhar RJ, **Aeddula OK**, Bertoni A, Wall J, Larsson T. "Supporting Changeability Quantification in Product-Service Systems Via Clustering Algorithm", Proceedings of the Design Society. 2023; 3:3225-3234. doi:10.1017/pds.2023.323
- **Omsri Aeddula**, "Data-Driven Decision Support Systems for Product Development - A Data Exploration Study Using Machine Learning", Licentiate dissertation, Blekinge Tekniska Högskola, Karlskrona, 2021, DOI: http://dx.doi.org/10.13140/RG.2.2.35254.22085
- **Omsri Aeddula**, Johan Flyborg, Tobias Larsson, Peter Anderberg, Johan Sanmartin Berglund, Stefan Renvert, "A Solution with Bluetooth Low Energy Technology to support Oral HealthCare Decisions for Improving Oral Hygiene" In Proceedings of the 5th International Conference on Medical and Health Informatics (ICMHI 2021). DOI: https://doi.org/10.1145/3472813.3473179
- **Omsri Aeddula**, Johan Wall, Tobias Larsson, "Artificial neural networks supportingcause and effect studies in product-service system development", ICORD 2021 - 8th International Conference on Research into Design, Springer, 2021. DOI: https://doi.org/10.1007/978-981-16-0119-4_5
- Johan Wall, **Omsri Aeddula**, Tobias Larsson, "Data analysis method supporting cause and effect studies in product-service system development", DESIGN 2020 - 16th International Design Conference, Cambridge University Press, 2020. DOI: https://doi.org/10.1017/dsd.2020.123
- **Omsri Kumar Aeddula**, Irina Gertsovich, "Image-Based Localization System", 8th ICIECE Conference, August 2019. DOI: https://doi.org/10.1007/978-981-15-3172-9_52
- **Omsri Kumar Aeddula**. Automatic Image Based Positioning System. (Digital Scientific Archive, URN: urn:nbn:se:bth-15224)
- **Aeddula, O.**, Wall, J., & Larsson, T. (2024). AI-Driven Multivariate Cause-and-Effect Analysis Studies in PSS Development: Exploring Interaction Effects [Pre-print].
- **Aeddula, O.**, Wall, J., Larsson, T., Berglund, J. S., & Anderberg, P. (2024) Artificial Intelligence-Based Decision Support System for Assessing Degree of Ossification in Bone Age Estimation: Towards a Product Service System Approach [Pre-print].

- Frank, M., **Aeddula, O**., Elfsberg, J., Askling, C. J., Larsson, T. (2024). Conceptualizing autonomy: Mapping industrial offerings as an integrated product system (CIP).

MORE INFORMATION

Research Gate	https://www.researchgate.net/profile/Omsri-Aeddula/research
Professional Page	https://www.bth.se/staff/omsri-kumar-aeddula-oka/

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