



SYMBIOSIS INTERNATIONAL (DEEMED UNIVERSITY)

**SYMBIOSIS CENTRE FOR APPLIED
ARTIFICIAL INTELLIGENCE**

**RESEARCH ADVISORY BOARD MEETING
FEBRUARY 2021**

Dr K Kotecha

Head, SCAAI



About the Centre

- Established in May 2019, Symbiosis Centre for Applied Artificial Intelligence has grown to a centre with five affiliated faculty members who are full time teaching faculty at Symbiosis Institute of Technology in various departments.
- SCAAI has more than 17 PhD students affiliated with it working in various domains of technology.
- 49 UG students from SIT and 11 interns/affiliates from outside are working as full time or part-time interns with SCAAI. Outside students are from various universities in India including IITs and some experienced candidates too.
- There is no major lab equipment, however faculty and students affiliated with SCAAI access the GPU at SCEI.



Financial Outlay

Year	Total Capital and Revenue Expenditure (INR)
May 2019- March 2020	1,10,350/-
April 2020- to-date	8,89,834/-
Total	10,00,184/-



Research Grants (Sanctioned)

1.SPARC Grant of MHRD, Govt of India, with Arizona State University, USA on Development of Algorithms for Credibility Analysis of Information(CAI)in collaboration with Arizona State University, USA. PI : Dr K Kotecha, Co-PI : Dr Rahee Walambe

Grant Amount: 82.6L (Ongoing, to be extended due to COVID 19)

2. SPARC Grant of MHRD, Govt of India, with University of Queensland, AUS on Development of Explainable AI Techniques for Complex Disease Diagnosis using Genomics Data (XAI) in collaboration with University of Queensland, Australia, PI : Dr Rahee Walambe, Co-PI : Dr K Kotecha. **Grant Amount: 84.6L (Ongoing, to be extended due to COVID 19)**

3. DUO ASME India Professor Fellowship awarded to Dr Kotecha with Dr George Ghinea of Brunel University, UK. **Grant Amount: 4.7L (completed)**

4. DUO ASME India Professor Fellowship awarded to Dr Rahee with Dr Stasha Lauria of Brunel University, UK. **Grant Amount: 4.7L (completed)**



Q1 Papers Published/Accepted since May 2020

1. Machine Learning Techniques and older adults processing of online information and misinformation: A Covid 19 Study. J Choudrie, S Banerjee, K Kotecha, R Walambe, H Karande, J Ameta in Computers in Human Behaviours. January 2021. <https://doi.org/10.1016/j.chb.2021.10671> (IF 5.003)
2. Bhandari N, Khare S, Walambe R, Kotecha K. 2021. Comparison of machine learning and deep learning techniques in promoter prediction across diverse species. PeerJ Computer Science 7:e365 <https://doi.org/10.7717/peerj-cs.365> February 2021 (IF 3.09)
3. COVID-19 Pulmonary Consolidations Detection in Chest X-Ray using Progressive Resizing and Transfer Learning Techniques. Anant Bhatta , Amit Ganatra, Kotecha Ketan in PeerJ Computer Science, Accepted. January 2021 (IF 3.09)
4. Ambient Acoustic Event Assistive Framework for Identification, Detection, and Recognition of Unknown Acoustic Events of a Residence. Pandya, S.; Advanced Engineering Informatics, Elsevier. 2020 (<http://www.sciencedirect.com/science/article/pii/S147403462030207X>) (IF 3.89)
5. Pollution Weather Prediction System: Smart Outdoor Pollution Monitoring and Prediction for Healthy Breathing and Living. Pandya, S.; Ghayvat, H.; Sur, A.; Awais, M.; Kotecha, K.; Saxena, S.; Jassal, N.; Pingale, G. Sensors, 2020. <https://doi.org/10.3390/s20185448>) (IF 3.275)



Q1 Papers Published/Accepted since May 2020

6. Healthcare Professional in the Loop (HPIL): Classification of Standard and Oral Cancer-Causing Anomalous Regions of Oral Cavity Using Textural Analysis Technique in Autofluorescence Imaging. Awais, M.; Ghayvat, H.; Krishnan Pandarathodiyil, A.; Nabillah Ghani, W.M.; Ramanathan, A.; Pandya, S.; Walter, N.; Saad, M.N.; Zain, R.B.; Faye, I. Sensors, 2020 <https://doi.org/10.3390/s20205780> (IF 3.275)
7. Histogram of Oriented Gradient-Based Fusion of Features for Human Action Recognition in Action Video Sequences. Patel, C.I.; Labana, D.; Pandya, S.; Modi, K.; Ghayvat, H.; Awais, M. Sensors 2020, <https://doi.org/10.3390/s20247299> (IF 3.275)
8. A review of microscopic analysis of blood cells for disease detection with AI perspective. Shilpa Gite, Accepted for publication in PeerJ Computer Science. (IF 3.09)
9. Srivastava A, Jain S, Miranda R, Patil S, Pandya S, Kotecha K. 2021. Deep learning based respiratory sound analysis for detection of chronic obstructive pulmonary disease. PeerJ Computer Science 7:e369 <https://doi.org/10.7717/peerj-cs.369> (IF 3.09)
10. Gite S, Khatavkar H, Kotecha K, Srivastava S, Maheshwari P, Pandey N. 2021. Explainable stock prices prediction from financial news articles using sentiment analysis. PeerJ Computer Science 7:e340 <https://doi.org/10.7717/peerj-cs.340> 2021. (IF 3.09)



Q2 Papers Published/Accepted since May 2020

1. Integration of Explainable AI and Blockchain for Secure Storage of Human Readable Justifications for Credit Risk Assessment R Walambe, A Kolhatkar, K Kotecha, et al in Communications in Computer and Information Science, Springer (accepted for publication in February 2021)
2. Detection of Hateful Speech for Hinglish Data on Social Media B Yagnik, M Hasan, A Shrivastava, R Walambe, K Kotecha in Lecture Notes in Electrical Engineering series, Springer (accepted for publication in February 2021)
3. Deep Learning based Framework for Retinal Vasculature Segmentation S Tiwari, A Dholaria, G Nigam, R Walambe, R Agarwal, K Kotecha in Lecture Notes on Data Engineering and Communications Technologies, (accepted for publication in February 2021)
4. Sur S., Pandya, S., Ramesh P. Sah, Ketan Kotecha & Swapnil Narkhede, Influence of bed temperature on performance of silica gel/methanol adsorption refrigeration system at adsorption equilibrium, Particulate Science and Technology, Taylor and Francis, 2020. DOI: [10.1080/02726351.2020.1778145](https://doi.org/10.1080/02726351.2020.1778145)
5. Barot, V., Kapadia, V., & Pandya, S., QoS Enabled IoT Based Low Cost Air Quality Monitoring System with Power Consumption Optimization, Cybernetics and Information Technologies, 2020, 20(2), 122-140. doi: <https://doi.org/10.2478/cait-2020-0021>.
6. Evaluating the Impact of ANN Architecture for Driver Activity Anticipation in Semi-autonomous Vehicles, Shilpa Gite. (Accepted for publication)



SCAAI Collaborations(International)

Publications

- With Dr. Jyoti Choudrie, University of Hertfordshire, UK Q1 Paper in Computers in Human Behaviour (Q1, IF 5.003)
- With Dr TS Raghu, Arizona State University, USA, Q1 Paper in PeerJ CS Journal (SPARC funding, Q1, IF 3.09)
- With Dr George Ghinea, Brunel University, UK, SCOPUS Paper in Applied Sciences Innovations, MDPI

Joint Proposals

- SPARC Funding with University of Queensland , Australia (ongoing)
- SPARC Funding with Arizona State University, USA (ongoing)
- BRICS Proposal: Dr. Liang(University of São Paulo, Brazil), Dr Hongdong(University of Wuhan, China), Dr. Yury Nechiporenko (Russia), SCMIA and SCAAI
- Indo- Serbia Proposal with Dr Aleksandar Jovanovic and Dr Katarina Kukic and Dr Vaishali Khairnar, Terna College of Engineering
- Indo- Serbia proposal with Dr Marina Marjanović-Jakovljević
- Indo-Slovenia Proposal with Dr. Dejan Lavbič
- FB Proposal with Brunel University, University of Hertfordshire, UK
- ICSSR –ESRC Proposal with Brunel University, University of Hertfordshire, UK



SCAAI Collaborations(International)

Exchange Visits

- 2 visits (Dr Kotecha and Dr. Rahee to UK under the DUO ASEM Professor fellowship Award). The UK counterparts will visit in 2021
- Applied for INSA grant (2) with University of Sao Paulo, Brazil

Co-Supervisor for PhD

- Dr. Vincenzo Piuri, Polytechnic University of Milan, Italy in the field of multimodal explainability in healthcare
- Dr. V Potdar, Curtin University, Australia in the field of Blockchain development for federated learning in healthcare
- Dr Sheela Ramanna, University of Winnipeg, Canada in the domain of multimodal information extraction
- Dr. Jyoti Choudrie, University of Hertfordshire, UK, for emotion analysis
- Dr Biswajeet Pradhan, University of Technology Sydney, Australia in geospatial domain



SCAAI Collaborations(within SIU)

Publications

- With Dr. Satyajeet Khare, SSBS in PeerJ Computer Science (Q1, IF 3.09)
- With Dr Jyoti Chandiramani and Dr. Ishita Ghosh, SSE (under preparation)

Proposals and Projects

- ICSSR-ESRC Proposal with SSE in Bilateral Trade
- BRICS proposal with SCMIA in Covid 19 multimodal AI based study
- Indo Australia Proposal with SUHRC in Covid 19
- ICF proposal with SSE for smart mobility

Trainings

- BTech (AI ML) and MTech (AI ML) in collaboration with SIT
- FDP in collaboration with STLRC on AI



Other SCAAI Collaborations





Grant proposal submitted (Results not yet declared/rejected)

- BRICS Proposal: Dr. Liang(University of São Paulo, Brazil), Dr Hongdong(University of Wuhan, China), Dr. Yury Nechiporenko (Russia), SCMIA and SCAAI (applied in August 2020, results awaited) in the area of Multimodal AI based Spatio-temporal prediction of Covid-19
- Indo- Serbia Proposal: with Dr Aleksandar Jovanovic and Dr Katarina Kukic, University of Belgrade, Serbia and Dr Vaishali Khairnar, Terna College of Engineering (applied in October 2020, results awaited) in the domain of transportation engineering
- SERB Power Scheme : In the area of misinformation in healthcare domain (applied in January 2021, results awaited)
- ICF Proposal : Submitted with SSE, Aston University, Middlesex University and TCS (rejected in second round)
- FB Proposal : Submitted with Brunel University, UK, Hertfordshire University, UK (rejected).
- Indo-Serbia Proposal: with Dr. Marina Marjonovic, Singhidunum University, Belgrade, Serbia (results awaited).
- Indo-Slovenia Proposal: with Dr.Dejan Lavbic, University of Ljubljana(Results awaited)

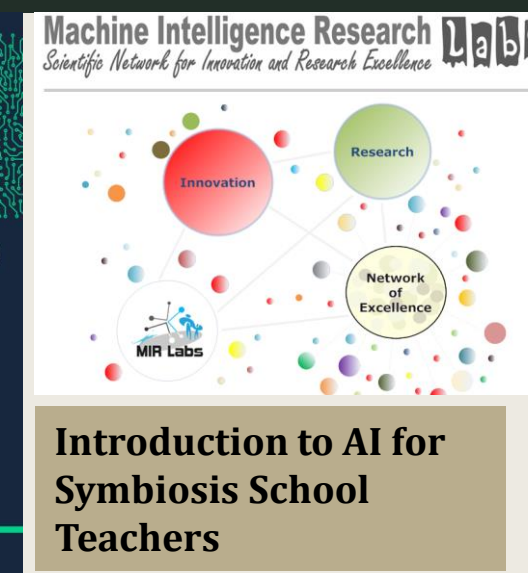


Papers (Communicated, 5 Q1 and 1 Q2)

1. A Review on Explainability in Multimodal Deep Neural Nets, Gargi Joshi, Rahee Walambe, K Kotecha to IEEE Access (Communicated in February 2021, Q1 IF 3.08)
2. Cascaded Complementary Filter Architecture for Sensor Fusion in Attitude Estimation. Parag Narkhede, Shashi Poddar, Rahee Walambe, George Ghinea, Ketan Kotecha submitted to Sensors, MDPI (Submitted in December 2020, Major revisions obtained, Currently under review, Q1 IF 3.275)
3. Stance detection with BERT embeddings for credibility analysis of information on social media. Hema Karande, Rahee Walambe, Victor Benjamin, Ketan Kotecha, T.S. Raghu, submitted to PeerJ Computer Science (Submitted in Sept 2020, Major revisions received, resubmitted in February 2021, Q1 IF 3.09).
4. Incremental Learning of LSTM Framework for Sensor Fusion in Attitude Estimation. Parag Narkhede, Shashi Poddar, Rahee Walambe, Ketan Kotecha, submitted for consideration to PeerJ Computer Science (Submitted in October 2020, Major revisions received, resubmitted in February 2021 Q1 IF 3.09)
5. Applying and Understanding an Advanced, Novel Deep Learning Approach: A Covid 19, Text Based, Emotions Analysis Study, information systems frontiers, Shruti Patil et al.
6. Algorithm Agnostic Novel Approach to Explainable Reinforcement Learning using Probabilistic Graphical Models. Saurabh Deshpande, Rahee Walambe, Ketan Kotecha, submitted to Journal of Experimental & Theoretical Artificial Intelligence (Submitted July 2020, Revision received Dec 2020, re-submitted for review January 2021).



Workshops, Trainings and Talks



- Introduction to AI in collaboration with STLRC is organized from 22nd – 26th February 2021
- Delivered talk on Research Directions in Deep Learning in Knowledge Incubation under TEQIP III (KITE) project at IIT Bombay funded by Ministry of Education, Govt. of India and the World Bank Dec 2020.
- Five days workshop on AI and data Science in collaboration with RRU, University of national importance in March 2021.





Plans for Year 2021

Increasing Research Impact (publications, patents, Student involvement)

Research Grants

Consultancy Projects

Training sessions and workshops

Collaborating with other Research Centers

Developing the ecosystem: Research to incubation, Research to Teaching



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SYMBIOSIS CENTRE FOR APPLIED ARTIFICIAL INTELLIGENCE

THANK YOU