

4th International Conference on Machine Intelligence and Signal

Processing (MISP2022), March 12-14, 2022

(<https://misp2022.nitr.ac.in/>)

Organized by

Department of Computer Science and Engineering,

National Institute of Technology Raipur, India

Tutorials

Title: Design of Computational Model for Human Walking Activity Recognition using Deep learning and Simulation using Open Sim and Webtos.

Brief about Workshop: This work will provide the overview about Human walking evolution, learning mechanism and simulation over different software platforms. The workshop will give the insight of how human walk can be utilized to design of bipedal robot, assistive device & rehabilitation of elderly and disabled person?. Further, it will help us to understand the neuromuscular and biomechanics associate with human walk evolution. The workshop will demonstrate the simulation of different walking activity for diagnosis of normal and unhealthy walk, rehabilitation, posture stability and balancing of human structure. The Human walk or gait pattern is very important parameter to understand and analysis the different abnormality and impairment happen in human walking. As human walk used to get suffer with different factors like aging, mental toughness, disease like Parkinson and multiple sclerosis. The tutorial will give hands on practice on human walking activity recognition using deep leaning model and implementation of tinyML for design of edge computing device

Schedule:

Date: 13th March 2022.

Time	Speaker	Talk/ Hands on session
9.00-9.30AM	Dr. Vijay Bhaskar Semwal	Introduction to Human Robot interaction and gait analysis.
9.30-10.00AM		Simulation of Human walk in Open Sim and Design of model in Webtos Simulator
10.00-10.30AM		Design of Deep learning model for Human walking activity Recognition using tinyML.

Tutorial Coordinator

Dr. Vijay Bhaskar Semwal, Assistant Professor,

Department of Computer Science and Engineering,

Maulana Azad National Institute of Technology (MANIT) Bhopal, Madhya Pradesh, India

Email Id: vsemwal@gmail.com

Contact Number: +91-7541805885

Website: <http://www.manit.ac.in/content/dr-vijay-bhaskar-semwal>

Key Publications (<https://scholar.google.co.in/citations?user=cPorLCwAAAAJ&hl=en>):

1. Semwal, Vijay Bhaskar, et al. "Design of vector field for different subphases of gait and regeneration of gait pattern." *IEEE Transactions on Automation Science and Engineering* 15.1 (2016): 104-110.
2. Semwal, Vijay Bhaskar, and Gora Chand Nandi. "Generation of joint trajectories using hybrid automate-based model: a rocking block-based approach." *IEEE Sensors Journal* 16.14 (2016): 5805-5816.
3. Semwal, Vijay Bhaskar, and Gora Chand Nandi. "Toward developing a computational model for bipedal push recovery—a brief." *IEEE Sensors Journal* 15.4 (2015): 2021-2022.
4. Semwal, Vijay Bhaskar, Kaushik Mondal, and Gora Chand Nandi. "Robust and accurate feature selection for humanoid push recovery and classification: deep learning approach." *Neural Computing and Applications* 28.3 (2017): 565-574.
5. Semwal, Vijay Bhaskar, et al. "Biologically-inspired push recovery capable bipedal locomotion modeling through hybrid automata." *Robotics and Autonomous Systems* 70 (2015): 181-190.
6. Semwal, Vijay Bhaskar, et al. "An optimized feature selection technique based on incremental feature analysis for bio-metric gait data classification." *Multimedia tools and applications* 76.22 (2017): 24457-24475.
7. Semwal, Vijay Bhaskar, et al. "Pattern Identification of different human joints for different human walking styles using inertial measurement unit(IMU) Sensor." **Artificial Intelligence review Springer(2021)** (Accepted)

Short Bio-Data: Vijay Bhaskar Semwal (Dr.) is working as an Assistant professor (CSE) at NIT Bhopal since February 2019. Before joining NIT Bhopal he was working at NIT Rourkela. He has also worked with IIIT Dharwad as Assistant Professor(CSE) for 2 year (2016-2018) and he has also worked as Assistant professor (CSE) at NIT Jamshedpur . He has earned his doctorate degree in robotics from IIIT Allahabad (2017) , M.Tech. in Information Technology from IIIT Allahabad (2010) and B.Tech. (IT) from College of Engineering Roorkee (2008). His areas of research are Bipedal Robotics, Gait Analysis and synthesis, Artificial Intelligence, Machine Learning for tiny application, IoT, Deep Learning and Theoretical Computer Science. He has published more than 21 SCI research papers. He has received early career research award of 22 Lakh by DST-SERB under government of India. He is also recipient of SRG grand of 25 Lakh from Higher Education Financing Agency (HEFA) of minister of higher education and received travel support to present work in prestigious IEEE conference Tencon 2016 at NTU Singapore. His research areas are algorithm prospective of machine learning, artificial Intelligence and bipedal robotics. He has delivered more than 50 expert talks. Currently he is working on human health monitoring using gait pattern, human activities recognition using tinyML, reconstruction of occluded& impaired gait .