



(Global Initiative of Academic Network)

# Innovative Principles of Gait Training: Neuroplasticity Principles, Biomechanics, and Computational Methods.

(December 26, 2017-December 30, 2017)

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## Overview

As walking is a crucial component of activities of daily living, individuals with neurological pathologies such as stroke and multiple sclerosis consider restoration of walking an important goal of rehabilitation. A majority of individuals with post-stroke hemiparesis present with deficits in walking function (e.g. slowed gait speed, reduced endurance, gait asymmetry) and biomechanical gait impairments (e.g. foot drop, reduced paretic propulsion, circumduction). Due to the high impact of gait dysfunction on quality of life of individuals with neurological pathologies, there is a significant focus in rehabilitation research toward the development of innovative, evidence-based techniques to evaluate and treat gait dysfunction.

The goal of this course is to provide the attendees with innovative, high-impact research evidence related to the evaluation and treatment of gait dysfunctions in neurological populations such as stroke and Parkinson diseases etc. The course will provide a detailed description of innovative measurement techniques, including 3-dimensional gait biomechanics, multi-muscle electromyography, non-invasive brain stimulation for measurement of corticospinal excitability of lower limb muscles, peripheral nerve stimulation for evaluation of spinal excitability, and clinical gait function. The treatment techniques will include treadmill training with and without body-weight support, functional electrical stimulation, real-time gait biofeedback, virtual reality biofeedback training, split-belt walking, etc.

An internationally reputed faculty member with mastery in teaching, research, and expertise in stroke gait biomechanics and gait rehabilitation will conduct this course.

<b>Modules</b>	<p><b>A: Basic Concepts and Techniques for Measurement of gait function: December 26,2017</b></p> <p><b>B: Advanced Topics and Evaluation of Gait: December 27 – December 28, 2017.</b></p> <p><b>C: Innovative treatment interventions for Gait December 29 – December 30, 2017</b></p> <p><b>Number of participants for the course will be limited to thirty.</b></p>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"> <li>▪ You are graduate or undergraduate student in Electronics, Computer Science, Electrical, Biomechanics, Pathology and Biomedical Engineering.</li> <li>▪ You are a clinical scientist working with medicine industry and healthcare domain or want to pursue your career as a gait analytics.</li> <li>▪ You are a Ph.D. student or faculty from academic institution interested in developing clinical applications for measurements and training of gait.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from abroad : US \$500</b>  <b>Industry/ Research Organizations : INR 10000</b>  <b>Academic Institutions (Faculty): INR 5000</b>  <b>Students: INR 2000</b></p> <p>The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.</p>

**December 26, 2017-  
December 30, 2017**

**At**

**National Institute of  
Technology Rourkela**

**Course Co-ordinator**

**Dr. Anup Nandy**

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Register yourself at

<http://www.gian.iitkgp.ac.in/GR>  
EGN/index

## The Faculty



**Dr. Trisha Kesar** is a faculty in Rehabilitation medicine at Emory University School of medicine, Atlanta, Georgia, USA. Dr. Kesar is the Director of the Motion Analysis Laboratory at Emory Rehabilitation Hospital. She earned her Master's and PhD in

Biomechanics and Movement Sciences from University of Delaware, USA. She completed post-doctoral research training to gain additional research expertise in post stroke gait rehabilitation at University of Delaware, and a visiting post-doctoral fellowship in neurophysiological evaluation using transcranial magnetic stimulation (TMS) at University of Maryland Baltimore, USA. Prior to her post-graduate training in USA, Dr. Kesar completed a Bachelors of Physiotherapy degree from Post Graduate Institute of Medical Education and Research (PGIMER), India. Dr. Kesar's research goal is focused on developing novel gait rehabilitation interventions and strategies that are based on an in-depth understanding of the neuroplasticity, biomechanical, and motor learning mechanisms underlying gait and gait training.



**Dr. Anup Nandy** is a faculty in the Department of Computer Science and Engineering at National Institute of Technology Rourkela. He earned his Ph.D. degree from IIIT-Allahabad. He has received an Early Career Research Award as research grant from SERB, Department of Science of Technology. He has also received an International Indo-Japanese Project grant for pursuing Human Gait Analysis research. His research area includes Human Gait Analysis, Machine Learning, Robotics, and Computer Vision.