

VEEKY BATHS

Assistant Professor, Dept. of Biological Sciences

BITS-Pilani, K.K. Birla Goa Campus

Goa-403726, India

Email: veeky@goa.bits-pilani.ac.in

URL: <http://universe.bits-pilani.ac.in/goa/veeky/profile>

Lab Web Page: <http://www.bitscogneuro.com/>



RESEARCH INTERESTS:

My Research areas and core competencies are in the field of **Computational Neuroscience, Biomedical Engineering, Brain Computer Interface, Systems Biology, Biomedical and Neural Signal Processing, Machine Learning and Pattern Recognition, Bioinformatics, Biological Sequence Analysis and Metabolic Network Analysis.**

Recently I've been awarded competitive grant by DST and started work on a project entitled "**Home automation and smart wheel chair based on Electroencephalography (EEG) signals produced in brain**"

A Brain-Computer Interface (BCI) is of great benefit to the differently abled, as it allows those with restricted freedom of movement to perform various actions which enable them to live an uncompromised, independent life. Such BCIs are possible by capturing and analysing electroencephalography (EEG) based potential responses to various stimuli. BCIs can be used for a host of activities, including cursor control, with spellers, to control wheelchairs and for home automation and control of various devices. A novel BCI-based home automation system and smart wheel chair that works with two responses - Steady State Visually Evoked Potential (SSVEP) and the eye-blink artifact. These two responses together facilitate a robust and efficient system that can serve the largest section of society to varying degrees. This system can be used without having to train the user in advance and is free from the fatigue and long delays usually associated with P300 or GUI-based systems.

Also working on Neuroengineering and Alzheimer Disease . Alzheimer Disease (AD) is a fatal neuro-degenerative disorder of brain that causes cognitive decline in patients. It also leads to difficulties in performing day-to-day activities. The manifestation of amyloidosis results in the deposition of amyloid plaques in the CerebroSpinal Fluid (CSF) and alters its flow dynamics. Consequently, the change in the CSF flow exerts more pressure on the ventricular walls and results in deformation.

GENERAL INFORMATION:

Veeky joined the Department of Biological Sciences in 2005. He obtained his B.Sc Degree from Ravenshaw University and M.Sc. in **Bioinformatics** from the Orissa University of Agriculture and Technology. He completed his Ph.D. Degree in Science from Bits-Pilani K.K.Birla Goa Campus in the year 2011. He then obtained an MBA from Goa Institute of Management

EDUCATIONAL QUALIFICATION:

Ph.D: Thesis Title: Systems Biology and Graph Theoretic Approaches to Identify Potential Drug Targets against *Mycobacterium tuberculosis* (BITS-Pilani) (2011)

Post Graduation: Executive M.B.A (Management Information Systems,
Project management, Strategic Management, Business statistics)
Goa Institute of Management, Goa. (2012)

Post Graduation: M.Sc., Bioinformatics

Orissa University of Agriculture & Technology, Orissa
Scored 79.4 % (2002-2004)

Diploma: Post graduate Diploma in Clinical Biochemistry and Medical Biotechnology
Utkal University ,Vani Vihar (2001-2002)

Graduation: B.Sc., Zoology Hons. Utkal University, Orissa
Scored 62.8% (1997-2000)

PROFESSIONAL EXPERIENCE:

ACADEMIC:

Assistant Professor, Department of Biological Sciences, BITS-Pilani, K K Birla Goa Campus, Goa, from 15th May 2012–till date

Lecturer, Department of Biological Sciences, BITS-Pilani, K K Birla Goa Campus, Goa, from JUNE 2005–14th May 2012

ADMINISTRATIVE:

Faculty In-charge, BITS Alumni Affairs Division, May 2013-till date. BITS Alumni Affairs Division is functioning at the Institute as a nodal agency for maintaining liaison with the alumni all over the world and to involve them in the development of the institute.

Research Interests:

- **Biomedical Engineering, Neural Signal Processing,**
- **Brain Computer Interface**
- **Neuroengineering**
- **Systems Biology and computational approach to understand the integrity and robustness of metabolic network in *Mycobacterim tuberculosis***
- **Study of PageRank algorithm, used by Google to analyze large protein protein interaction network**
- **Bioinformatics and phylogenetic analysis of biological sequences**

Sponsored Project as Principal Investigator:

1. Cognitive Science Research Initiative (CSRI) of Department of Science and Technology (DST), Govt. of India sponsored research project, titled “Home automation and smart wheel chair based on Electroencephalography (EEG) signals produced in brain” Sanctioned Amount 39 Lakhs

2. Project Title: Protein-Ranking and Novel Intervention Strategies against *Mycobacterium tuberculosis* using Graph Theory and Bioinformatics Resources

Funding Agency: Department of Science & Technology SCIENCE AND ENGINEERING RESEARCH COUNCIL FAST TRACK PROJECT FOR YOUNG SCIENTISTS Sanctioned Amount 9 Lakhs

Peer Reviewed Journal Publications:

1. **Veeky Baths**, Tarkeshwar Singh and Anil Kumar. Disruption of Cell Wall Fatty Acid Biosynthesis in *Mycobacterium tuberculosis* Using the Concept of Minimum Robust Domination Energy of Graph. *Annual Research & Review in Biology* 4(12): 2037-2044, 2014
2. Kratarth Goel, Raunaq Vohra, Anant Kamath, and **Veeky Baths**. Home Automation Using SSVEP & Eye-Blink Detection Based Brain-Computer Interface. **IEEE** International Conference on Systems, Man, and Cybernetics October 5-8, 2014, San Diego, CA, USA
3. Veeky Baths, Utpal Roy, Tarkeshwar Singh, 2011. [Disruption of cell wall fatty acid biosynthesis in *Mycobacterium tuberculosis* using a graph theoretic approach.](#) **Theoretical Biology and Medical Modelling**, 8:5
4. Veeky Baths, Utpal Roy, 2011. Identification of distant coevolving residues in Antigen 85C from *Mycobacterium tuberculosis* using statistical coupling analysis of esterase family proteins. **Journal of Biomedical Research**, 25(3): 1-5.
5. Veeky Baths, V.V. Rohit Kumar, G.V.R. Praneeth and U. Roy, 2009. Graph theoretic approach on metabolomic networks of mycobacterial strains for potential drug targets. *Res. J. Microbiol.*, 4: 132-137.
6. Veeky Baths and Utpal Roy, 2011. Graph Theoretic Approach for metabolism disruption and developing a drug targeting methodology for the cure of Tuberculosis. *International Research Journal of Biochemistry and Bioinformatics*, 1(3): 066-070

Posters accepted in proceedings of National/International Conferences

Veeky Baths¹ and Utpal Roy² : Game theory, *Mycobacteria* and human being: Conflict of interest : National Conference on “Contemporary Trends in Biological and Pharmaceutical Research” (CTBPR-2011) March 12-13, 2011, Birla Institute of Technology Science, Pilani.

Veeky Baths¹ and ***Utpal Roy***² : Graph theory and Metabolomics at “National Conference on Emerging Trends in Life Sciences Research” held on March 6th & 7th, 2009 at BITS-Pilani.

Veeky Baths¹ and ***Utpal Roy***² : Statistical Coupling Analysis of Esterase family proteins for Identification of Distant Coevolving Residues in Antigen 85C from Mycobacterium tuberculosis, at “International Conference on Antimicrobial Research” (ICAR2010), 3-5 November, 2010. Valladolid (Spain)

DECLARATION

I hereby affirm that the information furnished in this form is true and correct.

Place: GOA

Veeky Baths