

Curriculum Vitae

Name: Veeky Baths

ORCID ID: 0000-0001-9980-5738

Nationality: Indian

Date of Birth: 07-03-1979

URL: <http://universe.bits-pilani.ac.in/goa/veeky/profile> , **Lab Web Page:** www.bitscogneuro.com

Educational Qualification:

- **Ph.D:** Thesis Title: Systems Biology and Graph Theory,BITS-Pilani - 2011
- **Post Graduation:** Executive M.B.A (Management Information Systems, Goa Institute of Management, Goa - 2012
- **Post Graduation:** M.Sc., Bioinformatics, Orissa University of Agriculture & Technology, Orissa- 2004
- **Graduation:** B.Sc., Zoology Hons. Ravenshaw College, Utkal University, Orissa- 2000.

Research Interests

- Cognitive Neuroscience
- Reinforcement Learning and its connections with Neuroscience
- Computational Neuroscience
- Computational Psycholinguistics
- Brain Computer Interface
- Cognitive Behavioural Therapy
- Biomedical Engineering, Neural Signal Processing
- Internet of Things (IoT) and Pervasive Healthcare

Fellowships and awards:

May to July 2018: Visiting Research Fellow, School of Biomedical Sciences: University of Leeds, UK

Awarded best paper presentation: Presented scientific talk titled “Automation of an electric wheelchair based on SSVEP and eye blink commands” in Indian Association for Cerebral Palsy Conference 2018 -IACPCon 2018 held on Nov 24-25, 2018 at Calcutta Medical College and Hospital, Kolkata, India.

Patent:

A system and method for controlling a plurality of household appliances Patent Application No: 2643/DEL/2014 (Status: Filed).

Sponsored Project as Principal Investigator:

1. Erasmus+ International grant for the proposal titled “Integrated Track in Brain and Cognitive Sciences (iBRAIN)” under the Capacity Building in Higher Education 2019 scheme. The total cost of this collaborative project is € 967160.00.
2. Literacy and Cognition Project funded by Max Planck Institute of Psycholinguistics, Nijmegen, The Netherlands 2018-2020. The cost of the project € 5800.
3. Cognitive Neuroscience Techniques and multimodal scheme to understand consumer behaviour funded by Course5 Intelligence Private Limited,2022 for Rs.1,227,600 INR
4. Mobile/Web and AR-VR Based Cognition Tracking, Analysis and Rehabilitation for healthy and cognitively impaired people Funded by BITS BioCyTiH Foundation, for Rs. 2,400,000 INR

Supervision Of Graduate Students And Postdoctoral Fellows:

2013-2022: Number of Postdocs:01/ PhD: 03 (completed), 03 (Pursuing)/ Masters Students:08
Department of Biological Sciences/ Cognitive Neuro Science Lab/ BITS,Pilani-K.K.Birla Goa
Campus/India

Teaching Activities:

2011 – 2015 Assistant Professor- Bioinformatics/ BITS,Pilani-K.K.Birla Goa Campus/India
2015 – 2022 Associate Professor – Cognitive Neuroscience, Computational Psycholinguistics,
Brain Computer Interface, Cognitive Behavioural Therapy, Biomedical Engineering, Neural
Signal Processing, Internet of Things (IoT) and Pervasive Healthcare/ BITS,Pilani-K.K.Birla
Goa Campus/India

Peer Reviewed Selected Journal/Conference Publications:

1. Reinforcement learning and its connections with neuroscience and psychology. Subramanian, A., Chitlangia, S., Baths, V. *Neural Networks*, 2022, 145, pp. 271–287
2. ML-Based Analysis to Identify Speech Features Relevant in Predicting Alzheimer's Disease. Kumar, Y., Maheshwari, P., Joshi, S., Baths, V. *ACM International Conference Proceeding Series*, 2022, pp. 207–213
3. Tracking the Progression and Influence of Beta-Amyloid Plaques Using Percolation Centrality and Collective Influence Algorithm: A Study Using PET Images. Baboo, G.K., Prasad, R., Mahajan, P., Baths, V. *Annals of Neurosciences*, 2022
4. Mahajan P and Baths V (2021) Acoustic and Language Based Deep Learning Approaches for Alzheimer's Dementia Detection From Spontaneous Speech. *Front. Aging Neurosci.* 13:623607. doi: 10.3389/fnagi.2021.623607
5. A Novel Approach to Learning Models on EEG Data Using Graph Theory Features—A Comparative Study. B Prakash, GK Baboo, V Baths, *Big Data Cogn. Comput.* 2021, 5(3), 39; <https://doi.org/10.3390/bdcc5030039>
6. Wheelchair automation by a hybrid BCI system using SSVEP and eye blinks. L Kanungo, N Garg, A Bhoje, S Rajguru, V Baths. arXiv preprint arXiv:2106.11008
7. BCI Controlled Quadcopter Using SVM and Recursive LSE Implemented on ROS K Chhabra, P Mathur, V Baths 2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2020)
8. Motor Imagery Based Multimodal Biometric User Authentication System Using EEG A Valsaraj, I Madala, N Garg, M Patil, V Baths 2020 International Conference on Cyberworlds (CW), 272-279
9. Recognizing Music Mood and Theme Using Convolutional Neural Networks and Attention A Dipani, G Iyer, V Baths. *MediaEval'20*, December 14-15 2020, Online
10. Vyaakarana: A Colorless Green Benchmark for Syntactic Evaluation in Indic Languages R Patil, J Dhillon, S Mahurkar, S Kulkarni, M Malhotra, V Baths arXiv preprint arXiv:2103.00854

- 11 . CNRL at SemEval-2020 Task 5: Modelling Causal Reasoning in Language with Multi-Head Self-AttentionWeights based Counterfactual Detection.R.Patil, V.Baths, Proceedings of the 14th International Workshop on Semantic Evaluation, pages 451–457 Barcelona, Spain (Online), December 12, 2020.
12. Psychological and Neural Evidence for Reinforcement Learning: A Survey, Ajay Subramanian, Sharad Chitlangia, **Veeky Baths** arXiv preprint arXiv:2007.01099, 2020 - arxiv.org.
13. Mohit Patil ; Nikhil Garg ; Lizy Kanungo ; Veeky Baths. Study of motor imagery for multiclass brain system interface with a special focus in the same limb movement. 2019 IEEE 18th International Conference on Cognitive Informatics & Cognitive Computing (ICCI*CC).
14. P Mehra, R Gupta, A Mahajan, **V Baths**. Multicollinearity Analysis for Cuffless Blood Pressure Estimation Regression Algorithms, Proceedings of the 2019 ACM 4th International Conference on Biomedical Imaging, Signal Processing October 2019, Pages 89–93 <https://doi.org/10.1145/3366174.3366188>
15. Shivam, Nilanjana Goswami, **Veeky Baths**, Soumyadip Bandyopadhyay, AES: Automated Evaluation Systems for Computer Programing Course, Proceedings of the 14th International Conference on Software Technologies, 2019, ICSoft, 508-513, 2019 , Prague, Czech Republic
16. Sai Ruthvik Thandayam, Lizy Kanungo, Mayur Jartarkar, **Veeky Baths** “Multimodal Device control using EEG in a simulated AR environment”, accepted for publication in IEEE ExPlore, 2019.
17. Merina Dhara, **Veeky Baths** and P. Danumjaya. Mathematical modeling and dynamics of tuberculosis infection among diabetic patients in India, J Anal (2018). <https://doi.org/10.1007/s41478-018-0086-5>
18. Advait Balaji, Aparajita Haldar, Keshav Patil, T Sai Ruthvik, Valliappan CA, Mayur Jartarkar, and **Veeky Baths**: EEG-based Classification of Bilingual Unspoken Speech using ANN, (1154) has been accepted for publication at the 39th Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC'17) held at the International Convention Center, JeJu Island, S. Korea, from 11-15 July 2017.
19. C A, Valliappan, Thandayam, Sai Ruthvik, Balaji, Advait, Dhingra, Piyush, **Baths, Veeky**. A Portable Real Time ECG Device for Arrhythmia Detection Using Raspberry Pi", Lecture Notes in Computer Science, Volume 192 of the Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering series: MOBIHEALTH 2016. LNICST 192, pp. 1–8, 2017. DOI: 10.1007/978-3-319-58877-3 24
20. Divyansh Khanna, Rohan Sahu, **Veeky Baths**, and Bharat Deshpande: Comparative Study of Classification Techniques (SVM, Logistic Regression and Neural Networks) to Predict the Prevalence of Heart Disease: International Journal of Machine Learning and Computing, Vol. 5, No. 5, October 2015
21. 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

22. **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.

Book Chapter:

1. M. Indhumathy, S. Arumugam, **Veeky Baths** and Tarkeshwar Singh, Graph theoretic concepts in the study of biological networks, *Applied Analysis in Biological and Physical Sciences, Springer Proceedings in Mathematics & Statistics 186, (2016) 187-200.*

2. **Veeky Baths** and Utpal Roy. “Novel Intervention Strategy against Tuberculosis: Insights from Graph Theory and Systems Biology” - Science against microbial pathogens: communicating current research and technological advances, Formatex Research Center, Spain. 2011.

3. **Veeky Baths**, Utpal Roy, (2013). Sequence analysis of Mycobacterial PE/PPE Proteins. Tuberculosis – A Comprehensive Clinical Reference. ISBN: iConcept Press.

Invited Talks:

1. Delivered an invited talk titled “Using EEG to decipher Consumer Choice” at the UK Sensory Motor Conference 2018 held in University of Leeds, UK, June 21-23, 2018.

2. Delivered an invited talk titled “Using EEG and Graph Theory to decipher Consumer Choice” at International Conference on Discrete mathematics and its application in Network Sciences - ICDMANS 2018 held in BITS Pilani, K. K. Birla Goa Campus, July 7-10, 2018.

3. Presented scientific talk titled “Automation of an electric wheelchair based on SSVEP and eye blink commands” in Indian Association for Cerebral Palsy Conference 2018 -IACPCon 2018 held on Nov 24-25, 2018 at Calcutta Medical College and Hospital, Kolkata (Awarded best paper presentation).

Conferences, Seminars and Workshops conducted:

1. Conducted an International workshop “AttLis 2017: Attentive Listener in the Visual World” in association with University of Hyderabad at BITS, Pilani-K. K. Birla Goa Campus on 3-4 March, 2017 as the convener of the workshop.

2. Conducted a national conference “Experimental Methods in Cognitive Neuroscience- EMCN-17” in association with University of Hyderabad at BITS, Pilani-K. K. Birla Goa Campus on 15-16 December, 2017.

3. Conducted an International conference “Architectures and Mechanisms of Language Processing AmLAP-Asia-2018” in association with University of Hyderabad at University of Hyderabad in 1-3 February 2018.

4. Conducted an “International workshop on Data sharing for open innovation in community-based rehabilitation” in association with University of Leeds at BITS, Pilani-K. K. Birla Goa Campus on Sept 27-29, 2018 as the convener.

5. Conducted an “International Symposium on Bilingualism and Cognition -ISBC 2018” in association with Centre for Neural and Cognitive Sciences (CNCS), University of Hyderabad at BITS, Pilani-K. K. Birla Goa Campus on Nov 1-3, 2018 as the Convener of the Symposium.

6. Conducted an International conference “3rd Annual Conference on Association for reading and writing in Asia-ARWA-2019” at BITS, Pilani-K. K. Birla Goa Campus on 28 Feb-1 March 2019.

7. Conducted an International workshop “OpenCBR Workshop II” in association with University of Leeds at BITS, Pilani-K.K.Birla Goa Campus on 15-17 March 2019.

8. Conducted a Hackathon “Design Thinking Hackathon” in association with University of Leeds at BITS, Pilani-K.K.Birla Goa Campus on 15-17 March 2019.

9. Conducted the 6th Annual Conference for Cognitive Sciences (ACCS – 2019) at BITS Pilani, K K Birla Goa Campus on December 10-12, 2019.

10. Conducted the 3rd Annual Workshop of the Society for the Cognitive Science of Culture (SCSC – 2020) in association with University of Hyderabad on February 4 – 7, 2020.

No. of Ph.D. Scholars Guiding/Guided: 1(PhD Completed), 2(Pursuing)

Posters/Abstracts accepted in proceedings of National/International Conferences: 15

Member of Scientific Society:

1. Honorary Board Member of ARWA- Association for reading and writing in Asia- 2019.
2. Founding Member of SCSC- Society for Cognitive Science of Culture
3. Lifetime Member of ADNAT- Association for the promotion of DNA fingerprinting and other DNA Technologies.

Professional Experience:

Academic:

- Associate Professor, Department of Biological Sciences, BITS-Pilani, K K Birla Goa Campus, Goa, from August 2018–till date
- Visiting Research Fellow, School of Biomedical Sciences: University of Leeds
- Assistant Professor, Department of Biological Sciences, BITS-Pilani, K K Birla Goa Campus, Goa, from 15th May 2012–August 2018
- Lecturer, Department of Biological Sciences, BITS-Pilani, K K Birla Goa Campus, Goa, From June 2005–14th May 2012

Administrative:

- Associate Dean, Alumni Affairs Division, BITS, Pilani-K. K. Birla Goa Campus-Aug 2018-till date.
- Faculty-In-Charge, Alumni Affairs Division, BITS, Pilani-K. K. Birla Goa Campus-May 2013-Aug 2018.

DECLARATION

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

Place: GOA

Veeky Baths