VISHAL KANNAN

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Otto Von Guericke University| Magdeburg, Germany. Master's student in MSc. Integrative Neuroscience| 2021-2023
Current GPA: 1.4

SASTRA Deemed University | Tamil Nadu, India
M. Tech (Integrated) Medical Nanotechnology and B. Tech in Bioengineering | **CGPA: 7.95/10** | Awarded July 2020

Course Work: Neuroscience: Theoretical Neuroscience, Systems Neurophysiology, Advanced Statistics in Neuroscience, Learning & Memory | Engineering basics | **Biology:** Biochemistry, Medical Sciences, Neurobiology and Cognitive Sciences | **Electronics:** Analog and Digital electronics, Microprocessor and Microcontroller, Biosignal Processing | **Applied Science:** Cognitive Neuroimaging, Machine Learning, Electrophysiology, Biomechanics, Biomedical Instrumentation, Physiological Control Systems, Biomaterials, Tissue Engineering & Regenerative medicine, Medical Prosthesis, Medical Nano Robotics, Biomedical Nanotechnology, and Animal Models in Biomedical Research | **Healthcare Management:** Clinical Engineering and Medical ethics

WORK EXPERIENCE

CortXplorer lab, Department of Systems Physiology of Learning, Leibniz Institute of Neurobiology (LIN)| Magdeburg, Germany | **Master Thesis** & ***Research Assistant (HiWi)*** | (Supervisor: Prof. Dr. Max Happel) *Aug 2022 – Present*

- "Cortical dynamics during heuristical decision making under uncertainty" – Creating a data analysis pipeline for performing data pre-processing. Performing channel layer specifications and current source density and statistical analysis on local field potential (LFP) signals and behavioural data to identify critical decision features in the rodent cortex.
- Spectral analysis on gerbil LFP data from auditory reversal learning experiment. Developing a General Linear Model (GLM) on to fit the experimental data and predict the decision choice based on spectral features.

Neuro-cybernetics and Rehabilitation Lab, Institute of Neurology, University Klinikum Magdeburg| Magdeburg, Germany | **Lab rotation Internship** | (Supervisor: Prof. Dr. Catherine Sweeney Reed) *March 2023 – April 2023*

- Comparison of potential classification features in a brain–computer interface applied to determine timing of functional electrical stimulation in post-stroke rehabilitation.

CortXplorer lab, Department of Systems Physiology of Learning, Leibniz Institute of Neurobiology (LIN)| Magdeburg, Germany | ***Research Assistant (HiWi)*** | (Supervisor: Prof. Dr. Max Happel) *Aug 2022 – Present*

- Spectral analysis on gerbil LFP data from auditory reversal learning experiment. Performing channel layer specifications and wavelet analysis to investigate the spectral patterns in each cortical layer.

Comparative Neuroscience Group, Leibniz Institute of Neurobiology (LIN)| Magdeburg, Germany | ***Research Assistant (HiWi)*** | (Supervisor: Prof. Dr. Michael Brosch) *Jan 2022 – Present*

- "Spike sorting of extracellular macaque neuronal data to identify single cell type and population level functional characteristics" – Worked on developing (Semi-) automated offline spike sorting algorithm in MATLAB
- Developing a hardware-software interface in MATLAB for spatial audio setup to investigate localization of sounds in monkeys.

Centre of Excellence for Road Safety, Indian Institute of Technology Madras | Chennai, India| ***Project Engineer and Junior Consultant*** | *July 2020 – June 2021*

- Standard work analysis in trauma care centres | Implementing lean principles and developing decision support systems to improve process flow and achieve "Zero wait time" for patients
- Integrated Road Accident Database (iRAD), a World Bank funded Govt. of India project - Consulting and training different stakeholders on interpreting the human factors involved in accident scene investigation | Technical writing of annual reports | Working on grid analysis to identify vulnerable road traffic accident spots across different states
- A non-contact ubiquitous health monitoring system using cECG, respiration and pressure distribution signals | Developed a PCA based signal processing algorithm for enhanced denoising and automated extraction of respiration rate from capacitive ECG (cECG)

Rehabilitation Bioengineering Group (RBG) Labs, IIT Madras | Chennai, India *Dec 2019 -June 2020* | ***Master thesis internship*** | "*Evaluating the Effect of Visual Cue on Physiological Tremor using Accelerometer and EMG Sensors"* (Presented at IEA Conference 2021) | Performed real time data collection from 8 healthy subjects and

validated the effect of visual cue on physiological hand tremor using statistical analysis under the guidance of Prof. Venkatesh Balasubramanian

Tissue Engineering and Additive Manufacturing (TEAM) Lab SASTRA, Thanjavur, India (Guide: Dr. S Anuradha)

- *"Development of 3D printed fracture specific orthopedic cast as a replacement for conventional casting systems"* (Submitted for patency) | Developed different CAD models and performed Finite Element Analysis to validate the best design with respect to both mechanical and material properties | Patent writing *Jun – Nov 2019*
- *"Additive manufacturing of biodegradable porous orthopaedic screw"* (Published) | Developed different head designs for the screw using CAD modelling and performed dimensional analysis for precise anatomical fitting *Jun – Nov 2018*

SASTRA, Thanjavur, India *Dec 2017- April 2018*
"Design and development of PORT-AQ, A portable EEG acquisition kit" | Designed and fabricated an EEG acquisition hardware using dry electrodes and developed an algorithm to detect mental alertness of an individual under the guidance of Dr. K Adalarasu

RELEVANT EXPERIENCE / ACTIVITIES

Chairman, Bioengineers at SASTRA **"BE@S' -** A student association of Department of Bioengineering and Medical Nanotechnology *June 2019 – June 2020*

International Genetically Engineered Machine (iGEM) | *Silver Medallist* in iGEM 2019 | Head of Sensor team – Development of an early-stage diagnosis tool for cervical cancer detection using toehold switches *2019*

Product Lead at **3D Implants** – an incubatee at SASTRA's Technology and Business Incubator (TBI**)** *2019*

SASTRA| "BE@TS" member | Head organiser of the National Seminar on Stem Cell Biology, "REGENESIS" *2018*

DST & Texas Instruments India Innovation Challenge Design Contest (IICDC), India | *Quarter finalist* in IICDC 2017| Development and productization of "E-Buzz" an antidozing system for detecting real time drowsiness in drivers under the guidance of Dr. K. Adalarasu *2017*

PUBLICATIONS

1. Kannan V., Adalarasu K., Natarajan P., Balasubramanian V. (2022) *Analyzing the Effect of Visual Cue on Physiological Hand Tremor Using Wearable Accelerometer Sensors. Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021).* https://doi.org/10.1007/978-3-030-74614-8_66
2. R. Dhandapani, P.D. Krishnan, A. Zennifer, V. Kannan, A. Manigandan, M.R. Arul, D. Jaiswal, A. Subramanian, S.G. Kumbar, S. Sethuraman*, Additive manufacturing of biodegradable porous orthopaedic screw, Bioact. Mater. 5 (2020) 458–467.* https://doi.org/10.1016/j.bioactmat.2020.03.009. **(Impact Factor : 8.724)**
3. A. Manigandan, M. Vimalanadhan, R. Dhandapani, S. Bagewadi, V. Kannan, S. Sethuraman, A. Subramanian, *Marigold-like tyrosinase-embedded nanostructures - a nano-in-micro system, Dalt. Trans. 49 (2020) 11329–11335.* https://doi.org/10.1039/d0dt02358b. **(Impact Factor : 4.174)**

PATENTS

Fabrication of 3D-printed fracture specific orthopedic cast. Patent Number: WO/2021/156894

PROFESSIONAL TRAINING

- Certified Machine Learning course by **Stanford University** through online platform Coursera | Grade: **95% |** Awarded September 2020

SOFTWARE

Python | MATLAB & SIMULINK | GitHub | SPSS | Microsoft Power BI | ANSYS | Solidworks | Blender | Autodesk Meshmixer | Origin | MS Word | MS power point | MS Excel

SKILLS

- **Research Skills** - Design of experiments | Technical writing for journals and conferences | Machine learning | Data processing and management
- **Soft Skills** - Leadership | Project management | Technical documentation | Critical Thinking | Problem Solving | Ability to quickly create and apply ideas and solutions

EXTRA CURRICULAR ACTIVITIES AND HOBBIES

- Member of Entrepreneurship Development Cell **(ED Cell**) at SASTRA during 2017-2019
- An explorer with a zeal to travel: activities like trekking, hiking; biking and badminton interest me

REFERENCES

1. **Prof. Dr. Max Happel**, Professur für Physiologie, Medical School Berlin, Berlin, Germany

   Email ID: *Max.Happel@lin-magdeburg.de*

2. **Prof. Dr. Catherine Sweeney Reed**, Universitätsklinik für Neurologie, Magdeburg, Germany

   Email ID: *catherine.sweeney-reed@med.ovgu.de*

3. **Prof. Dr. Michael Brosch**, Leibniz Institute of Neurobiology, Magdeburg, Germany

   Email ID: *Michael.Brosch@lin-magdeburg.de*