

CURRICULUM VITÆ

PERSONAL INFORMATION

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RESEARCH SUMMARY

Electrical engineer and computational neuroscientist specializing in clinically-relevant algorithm development for neurological disorders. Experienced in advanced signal processing and machine learning techniques for neural recordings (LFP, EEG), with proven ability to translate complex neurophysiological insights into practical diagnostic and therapeutic applications.

EDUCATION

2021–2025	PhD, Computational Neuroscience	<i>University of Würzburg, Germany</i>
2018–2019	MS, Biomedical Engineering	<i>University of Southern California, Los Angeles, USA</i> Completed: December 2019
2012–2016	BTech, Electronics & Instrumentation Engineering	<i>West Bengal University of Technology, Kolkata, India</i> Completed: July 2016

RESEARCH EXPERIENCE

2021–2025	PhD Candidate	<i>University Clinic Würzburg, Germany</i>
<ul style="list-style-type: none">Developed robust framework for identifying beta bursts in Parkinson’s disease LFP using wavelet decomposition, analyzing correlations with motor impairment for closed-loop DBS applicationsCreated classification model differentiating Parkinson’s disease from Essential tremor using peripheral signals (EMG, accelerometer), achieving substantial improvements over published metricsTranslated rat model findings to humans, examining beta burst amplitude relationships between STN LFP and motor cortex, with striatal dopamine as mediatorImplemented VAE-based deep learning models to identify latent neural representations in Deep Brain Stimulation patients, correlating latent space distances with clinical symptom scores across stimulation conditions		
2015–2016	Bachelor’s Thesis Research	<i>West Bengal University of Technology, India</i>
<ul style="list-style-type: none">Designed data-driven control system for DC motor positioning using MATLAB system identification and PID control with repetitive strategies		

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| 2015 | Research Intern <i>Variable Energy Cyclotron Centre, DAE, India</i> <ul style="list-style-type: none"> Developed hardware data acquisition system for superconducting magnets in particle accelerator, including pre-amplifier, isolator, and A/D converter circuits Integrated ARM processor-based system for real-time processing and remote transfer, now serving as facility infrastructure |
| 2014 | Research Intern <i>School of Mechatronics and Robotics, IIST Shibpur, India</i> <ul style="list-style-type: none"> Conducted experiments on Ionic Polymer Metal Composite IPMC sensors for finger motion capture, enabling human grasping replication through voltage outputs |

PUBLICATIONS

Sil, T., et al. (2025). Sensor-based data driven differentiation between Parkinson's disease and essential tremor. *Expert Systems with Applications* [In Revision].

Hofman, K.†, Chen, J.Z.†, **Sil, T.**, et al. (2025). Low β predicts motor output and cell degeneration in the A53T Parkinson's disease rat model. *Brain*, 2025: 00; 1–14. <https://doi.org/10.1093/brain/awaf063>

Sil, T., et al. (2023). Wavelet-based bracketing, time-frequency beta-burst detection: new insights in Parkinson's disease. *Neurotherapeutics*, 20, 1767–1778. <https://doi.org/10.1007/s13311-023-01447-4>

Khan, S., Paul, A., **Sil, T.**, et al. (2016). Position control of a DC motor system for tracking periodic reference inputs in a data driven paradigm. *International Conference on Intelligent Control Power and Instrumentation (ICICPI)*, 17–21. <https://doi.org/10.1109/ICICPI.2016.7859665>

Bhattacharya, S., Khan, S., **Sil, T.**, et al. (2015). IPMC based data glove for finger motion capturing. *Proceedings of the 2015 Conference on Advances In Robotics*, 1–6. Association for Computing Machinery, Goa, India. <https://doi.org/10.1145/2783449.2783500>

TEACHING & PROFESSIONAL EXPERIENCE

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| 2024–2025 | Course Instructor – Data Science <i>University Clinic Würzburg, Germany</i>
Delivered lectures and led coding tutorials for graduate-level data science courses during summer semesters. |
| 2018–2019 | Faculty Liaison <i>USC Rossier School of Education, Los Angeles, USA</i>
Coordinated between faculty and administration, supported PDP instructors, and managed admissions process for 336 students. |
| 2018–2019 | STEM Instructor <i>USC Viterbi School of Engineering, Los Angeles, USA</i>
Mentored 50 primary school students through the USC Viterbi STEM Educational Outreach Program. |

TECHNICAL SKILLS

Research:	Signal Processing, Machine Learning, Deep Learning, Algorithm Development
Programming:	MATLAB, Python (PyTorch, scikit-learn, SciPy, NumPy)
Management:	Project Management, Data Analysis, Academic Supervision
Languages:	English (fluent), Hindi (fluent), Bengali (native), German (beginner)

HONORS & AWARDS

2022	PhD Fellowship, Deutscher Akademischer Austauschdienst (DAAD), Germany
2020	Featured Graduate Student, USC Viterbi School of Engineering, USA
2015	Best Intern Project Award, Variable Energy Cyclotron Centre, India

REFERENCES

Prof. Dr. med. Jens Volkmann

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Würzburg, 2025

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