

# KAUSTUV KANTI GANGULI, PhD

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Google Scholar (h-index: 9)

## CAREER OBJECTIVE

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PhD in Electrical Engineering with a focus on signal processing and machine learning, 3 years of postdoc experience in artificial intelligence, possessing excellent research, statistics, and strong data assimilation skills, exploring relevant opportunities for a professorial career. Detail-oriented aptitude, capable of handling multiple projects simultaneously with minimal supervision, motivated to offer the highest quality of services with a complete focus on cutting-edge research and sustainable innovative teaching.

## SUMMARY

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- Interdisciplinary training in Electrical Engineering (10+), Computer Science (8+), Cognition (5+).
- Excellent backgrounds on speech and audio technologies, statistics, computational linguistics.
- Developer of cognitively-based artificial intelligence (AI) applications for multimedia solutions.
- Principal collaborator of two music computation projects worth \$2m and team of 12 scientists.
- 39 publications including high impact-factor journals, 241 citations with h-index: 9, i10-index: 9.
- Demonstrable skills both in modern deep learning and traditional handcrafted feature engineering.
- Experience in human-computer interaction (HCI) algorithms in virtual reality (VR) platforms.

## EDUCATION

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- **Indian Institute of Technology Bombay**, Mumbai, India **2013 – 2018**  
Doctor of Philosophy, Department of Electrical Engineering
- **Techno India Salt Lake**, Kolkata, India **2008 – 2012**  
Bachelor of Technology, Instrumentation Engineering, CGPA: **9.2/10**, Gold Medalist

## TECHNICAL STACK

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- Programming Languages: Python, MATLAB, C++, Javascript
- Analysis/Software Tools: Praat, Adobe, Librosa, Pandas, Seaborn
- Statistical Frameworks: SPSS, Scikit-learn, Weka, TensorFlow
- Development Tools: L<sup>A</sup>T<sub>E</sub>X, Docker, Jupyter, Github, MLflow

## RESEARCH AND WORK EXPERIENCE

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**Music and Sound Cultures (MaSC) Lab** **Jan 2019 – present**  
*Postdoctoral Associate in Machine Learning*, New York University Abu Dhabi, UAE

- Leveraged an AI approach building human-computer interactions in big-data information retrieval.
- Deployed prototypes for visualizing projected timbre similarity in immersive virtual reality space.
- Managed teams of signal processing interns for analyses and evaluation of scalable model design.
- Written grant for maqam tutorial on mathematical objectives of the music generation theories.

**Music Technology Group (MTG)** **Oct 2015 – Feb 2016**  
*Research Fellow*, Universitat Pompeu Fabra, Spain

- Formalized music retrieval problems into AI problems for large-scale corpus-level solutions.
- Developed state-of-the-art AI algorithms to translate music objectives into actionable insights.
- Contributed to content creation and data analysis for spin-off company MusicMuni Labs.

**Digital Audio Processing (DAP) Lab** **Jan 2013 – Dec 2018**  
*Doctoral Research Associate*, Indian Institute of Technology Bombay, India

- Designed language models for lexical understanding of music theory and performance trends.
- Proposed algorithms informed by domain knowledge to estimating statistical similarity space.
- Built actionable annotation and machine labeling via regression models for speech production.

## PROFESSIONAL TALKS AND LECTURES

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- Invited lectures at academic institutes (Stanford University, IITs, St. Xavier's College), industries (Spotify, Microsoft Research, TCS Innovations Lab), and music schools (NCPA, FAS, ITC SRA).
- Traveled to 17 countries for international conference and congress presentations in top-tier technical events including ISMIR, ICMPC, ICASSP; represented in India Science Festival.

## SELECTED PUBLICATIONS (5 OF 38)

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- K. K. Ganguli and P. Rao. "A Study of Variability in Raga Motifs in Performance Contexts," *Journal of New Music Research (JNMR)*, 50(1):102-116, 2021.
- K. K. Ganguli and P. Rao. "On the perception of raga motifs by trained musicians," *Journal of the Acoustical Society of America (JASA)*, 145(4):2418-2434, 2019.
- K. K. Ganguli and P. Rao. "On the distributional representation of raga and melody," *Transactions of International Society for Music Information Retrieval (TISMIR)*, 1(1):79-95, 2018.
- K. K. Ganguli, A. Anantapadmanabhan, and C. Guedes. "An approach to adding knowledge constraints by fractal analysis on a generative model of Carnatic rhythm sequence," in *Proc. of Analytical Approaches to World Music Conference (AAWM)*, Jun 2021, Paris, France.
- K. K. Ganguli, S. Gulati, X. Serra, and P. Rao. "Data-driven exploration of melodic structures in Hindustani music," in *Proc. of the 17th International Society for Music Information Retrieval Conference (ISMIR)*, Aug 2016, New York, USA.

## GRANTS, AWARDS, AND DISTINCTIONS

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- NYU Abu Dhabi Research Travel Grant for overseas conference in February, July, November 2019.
- Collaborator and co-PI for international grants from European Research Council, Indian Ministry of Information Technology, National Endowment for the Humanities.
- Best thesis award nomination, IIT Bombay (outcome awaited in convocation of 2021).
- Best paper award nomination at the ISMIR Conference in 2017, FRSM Symposium in 2014, 2016.
- Best code for ethical hacker award at the "Hacking Audio and Music Research" (HAMR) 2015 for developing a real-time lightweight raga recognition system 'Ragawise'.
- Awarded University Gold Medal (WBUT) as topper of 2008 - 2012 B. Tech. (EIE) batch.
- Distinct-ed fellow 'Scholar in Residence' at the 'Center for Digital Humanities' at NYU Library.

## RELEVANT GRADUATE COURSEWORK

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Audio Signal Processing for Music Applications, Applied Machine Learning, Artificial Intelligence, Advance Topics in Signal Processing and Statistics, Speech and Audio Coding, Automatic Speech Recognition, Advanced Python Programming, Algorithms and Data Science, Music Information Retrieval.

## ACTIVITIES AND SKILLS

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### Beyond curriculum

- Teaching and co-supervision of 13 Interns, 7 Masters and 5 Capstone projects on the topics of time-series classification, regression, anomaly detection, predictive analysis, optimization.
- Reviewer for reputed journals (TISMIR, JNMR, JASI, Frontiers), international conferences (ISMIR, ICASSP, ICMPC, SoMoS), national symposiums in India (SPCOM, NCC, FRSM).
- Experience on content acquisition and copyright/licenses, corpus management. Led the team from CompMusic project for data preparation, feature extraction, audit, quality control.

### Administrative positions

- Elected chair at the Postdoctoral Council Steering Committee (PCSC) at NYU Abu Dhabi.
- Deployed as member of the VC's Academic Strategy Task Force (ASTF) at NYU Abu Dhabi.

### Professional memberships

- ISMIR (2015 - ), IMS (2016 - ), ISCA (2017 - ), IEEE (2019 - ), ICTM (2020 - ).

### Outside curriculum

- 28+ years of music training, professional Hindustani music performing vocalist.
- Ethical hacking, Perfumes, Driving, Cooking, Traveling.

## REFERENCES

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Upon request