Nithya Nadig Shikarpur

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RESEARCH INTERESTS

Interested in developing interactive generative AI tools for music learning and creation to help people engage more deeply with the art, especially for non-Western forms of music.

EDUCATION

PhD. Computer Science Sept 2024 - Present

***Research Supervisor**: Dr. Cheng-Zhi Anna Huang*

Massachusettes Institute of Technology

M.Sc. Computer Science - Artificial Intelligence Aug 2022 - Aug 2024

***Research Supervisor**: Dr. Cheng-Zhi Anna Huang*

Université de Montréal & Montréal Institute of Learning Algorithms (Mila) GPA: 4.19/4.3

B.E. Computer Science Aug 2016 - Dec 2019

Birla Institute of Technology and Science (BITS) Pilani GPA: 8.46/10

SELECTED PROJECTS

Interactive Music Generation For Hindustani Music Aug 2022 - Present

Supervisor: Dr. Anna Huang | *Generative Modelling, HCI, Hindustani Music*

- Worked on interactive generative modeling for Hindustani vocal music.
- Work on the generative model published at ISMIR 2024.
- Work describing user studies conducted to study interaction with the generative model in submission at Neurips Creative AI track 2024.

Visual Aids for Memorization of Rhythms in Jazz Improvisation Aug 2022 - Jan 2023

Supervisor: Dr. Jeremy Cooperstock | *HCI, User Studies, Interface Design, Jazz*

- Studied the role of two visual representations to help users memorize rhythms from jazz improvisation.
- Conducted multiple iterations of design and user testing to develop the final interface.
- Conducted user studies and interviews involving 8 users followed by statistical analysis of observations.

Multimodal Raga Detection Aug 2021 - June 2022

Supervisor: Dr. Preeti Rao | *Multimodal Classification, Hindustani Music, Music Information Retrieval*

- Project combined hand gestures with audio data to classify raga (melodic mode).
- Experimented with different fusion techniques for audio and visual features.
- Ran qualitative and quantitative analyses of audio, visual and audio-visual model predictions.
- Paper published in ISMIR 2022 and awarded *Best Special Call Paper Award*.

Computational Analysis of Melodic Mode Switching in Raga Performance Dec 2020 - July 2021

Supervisor: Dr. Preeti Rao | *Hindustani, Computational Musicology, Music Information Retrieval*

- First computational study of melodic mode switching in Jasrangi Jugalbandi.
- Developed a semi-automated pipeline to extract pitch-related features directly from audio.
- Studied the distribution of notes using multiple representations of pitch features and analysed results.
- Paper published in ISMIR 2021.

SELECTED EXPERIENCE

Graduate Researcher | *Mila, MIT EECS* Aug 2022 - Present

Working on interactive music generation inspired by the Hindustani music idiom.

Research Assistant | *Digital Audio Processing Lab, IIT Bombay* Dec 2020 - June 2022

Worked on projects revolving around computational musicology for Hindustani music.

Research Intern | *McAfee* July 2019 - May 2020

Worked on malware detection using deep learning.

PUBLICATIONS, PATENTS AND TALKS

1. **N. Shikarpur**, C. Z. A. Huang. "Exploratory Study Of Human-AI Interaction For Hindustani Music". In Proc. of the 38th Conference on Neural Information Processing Systems (NeurIPS 2024) Creative AI Track.
2. **N. Shikarpur** "Towards human-AI co-creation for Hindustani music: modeling and interaction", Boston AI Music Meetup, September 2024.
3. **N. Shikarpur**, K. M. Dendukuri, Y. Wu, A. Caillon and C.Z.A. Huang. "Hierarchical Generative Modeling of Melodic Vocal Contours in Hindustani Classical Music". In Proc. of the 25th Int. Soc. for Music Information Retrieval Conference, 2024.
4. M. Clayton, P. Rao, **N. Shikarpur**, S. Roychowdhury, and J. Li. "Raga classification from vocal performances using multimodal analysis". In Proc. of the 23rd Int. Soc. for Music Information Retrieval Conference, 2022.
5. **N. Shikarpur**, "Raga classifiction from vocal performances using multimodal analysis", Music + AI Reading Group, Oct 2022. Link.
6. **N. Shikarpur** , A. Keskar, and P. Rao. "Computational analysis of melodic mode switching in raga performance". In Proc. of the 22nd Int. Soc. for Music Information Retrieval Conference, 2021.
7. A. Tripathi, M. A. Bhole, **N. Shikarpur**, T.R. Konda, and M. Bhatnagar. "Scanning of partial downloads", Aug 2022. US Patent.

TEACHING AND LEADERSHIP EXPERIENCE

Co-organizer: Music + AI Reading Group | *Mila + Online* Aug 2022 - Aug 2023

Organized online reading group related the music + AI research. Invited speakers with diverse backgrounds and hosted sessions.

Teaching Assisstant: Computer Programming | *BITS Pilani, Goa* Aug 2018 - Dec 2018

Helped devise questions for students and clarified doubts during lab sessions.

SELECTED HONORS & ACCOLADES

The Durlach Fellowship | *MIT* 2024

Scholar at Emmerson Harris Program for Private Study of Music | *MIT* 2024

International Student Scholarship, 3000 CAD | *DIRO & Quebec Ministry of Higher Education* 2023

Best special call paper award | *ISMIR 2022* 2022

VOLUNTEER EXPERIENCES

ISMIR, Bengaluru | *Volunteer* 2022

- Helped with organizing of the conference including sponsorship and logistics.

The Blueroom, Bangalore | *Artists Relations* 2019-2020

- Communicated with and invited artists to perform at the venue and handled communications.

SKILLS

- **Programming Languages** - *Advanced*: Python; *Intermediate*: C++, C, JavaScript, HTML5/CSS
- **Machine Learning** - *Advanced*: Pytorch, Keras, Tensorflow, Scikit-learn, Matplotlib, Numpy
- **Music** - *Advanced*: Vocalist (Hindustani music and other styles like thumri, jazz, pop and fusion music)

RELEVANT COURSEWORK

Representation Learning | Human Computer Interaction | Reinforcement Learning | Data Structures and Algorithms | Machine Learning

MUSIC

- I am an active performer of Hindustani vocal music and upload my performances and projects on YouTube and Instagram.
- Submitted to the AI Song Contest 2022. [Link].