Swarup Ranjan Behera

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RESEARCH INTEREST

Audio/Music Captioning, Audio/Music Retrieval, Audio Question Answering, Adversarial Attacks on Deep Models, Clinical NLP, Legal NLP, Sports AI, Conversational AI, etc..

EXPERIENCE

- **Reliance Jio AICoE**   Hyderabad, India
  Senior Research Scientist   *Sep 2021 - Present*
  - **Active Learning based Speech Inference Engine**: Developed an end-to-end framework for call-center and clinical text data collection, pre-processing, and normalization. Trained probabilistic and neural language models using the collected text data.
  - **Text to Speech Engine**: Developed an end-to-end framework for text collection, pre-processing, normalization, and text generation. Generated semantically similar sentences using Pegasus and T5 paraphraser.
  - **Sentiment Analysis**: Performed sentiment analysis on call centre transcripts to extract emotions and sentiments of customers and agents during and post the call to further improve customer experience.
  - **Contract Review AI**: Developed a CRA system that learns to automatically extract and identify key clauses from contracts, thus helping in-house legal teams to automate the contract review process during pre-signature phase.
  - **Conversational AI**: Developing a voice assistant that can engage in human-like dialogue, capturing context, and providing intelligent responses.

- **Reliance Jio AICoE**   Hyderabad, India
  Research Intern   *Jun 2021 - Aug 2021*
  - **Cricket Analytics for Mumbai Indians**: Developed an end-to-end framework for cricket text commentary collection (from ESPNcricinfo and IPLT20 websites), text normalization for Automatic Speech Recognition, and similar commentary generation (GloVe and WordNet) for Text-to-Speech synthesis.

- **IIT Guwahati**   Guwahati, India
  Teaching Assistant   *Jul 2013 - Dec 2020*
  - **Courses**: Software Engineering (Fall-2018, Fall-2019), Design and Analysis of Algorithms (Fall-2017), Computer Vision using Machine Learning (Fall-2016), Discrete Mathematics (Fall-2015), Probability and Linear Algebra (Spring-2014), Data Communication (Fall-2013).
  - **Labs**: Database (Spring-2015, Spring-2016, Spring-2020, Fall-2020), Computing (Spring-2017, Spring-2018, Spring-2019), Data Structures (Fall-2014).

EDUCATION

- **PhD in Computer Science and Engineering (Machine Learning)**   Guwahati, India
  IIT Guwahati (Thesis: Learning Player-specific Strategies using Cricket Text Commentary)   *Jul. 2015 – Sep. 2021*

- **M.Tech in Computer Science and Engineering**   Guwahati, India
  IIT Guwahati (CPI: 7.99)   *Jul. 2013 – Jun. 2015*

- **B.Tech in Computer Science and Engineering**   Burla, India
  VSSUT Burla (CPI: 8.30)   *Jul. 2008 – Jun. 2012*

PUBLICATIONS

- A. M. Tripathi, **S. R. Behera**, and K. Paul, *Reverse Adversarial Attack To Enhance Environmental Sound Classification*, IEEE International Joint Conference on Neural Networks (IJCNN), 2022. [Core Rank=A]

- A. M. Tripathi, **S. R. Behera**, and K. Paul, *K-Defensive Bit Planes: Defense Against Adversarial Attacks*, IEEE International Joint Conference on Neural Networks (IJCNN), 2022. [Core Rank=A]

- A. M. Tripathi, **S. R. Behera**, and K. Paul, *Investigation of Performance of Visual Attention Mechanisms for Environmental Sound Classification: A Comparative Study*, IEEE International Joint Conference on Neural Networks (IJCNN), 2022. [Core Rank=A]

- A. M. Tripathi, **S. R. Behera**, and K. Paul, *Adv-IFD: Adversarial Attack Datasets for An Intelligent Fault Diagnosis*, IEEE International Joint Conference on Neural Networks (IJCNN), 2022. [Core Rank=A]

- **S. R. Behera** and V. S. Vedula, *Mining Temporal Changes in Strengths and Weaknesses of Cricket Players Using Tensor Decomposition*, In proceedings of the 28th European Symposium on Artificial Neural Networks, Computational Intelligence and Machine Learning (ESANN), Bruges, Belgium, 2020. [Core Rank=B]

- **S. R. Behera**, P. Agrawal, A. Awekar and V. S. Vedula, *Mining Strengths and Weaknesses of Cricket Players Using Short Text Commentary*, 2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA), Boca Raton, FL, USA, 2019. [Core Rank=C]

- **S. R. Behera** and V. S. Vedula, *Learning Strength and Weakness Rules of Cricket Players using Association Rule Mining*, In proceedings of the 8th Workshop on Machine Learning and Data Mining for Sports Analytics (MSLA), ECML-PKDD Workshop, Virtual, 2021.

- **S. R. Behera** and V. S. Vedula, *Stats Aren't Everything; Learning Strengths and Weaknesses of Cricket Players*, In proceedings of the 7th Workshop on Machine Learning and Data Mining for Sports Analytics (MSLA), ECML-PKDD Workshop, Ghent, Belgium, 2020.

- **S. R. Behera**, *Performance Analysis of Batsman against Spin Bowling and Fast Bowling in Cricket*, Ohio State Sports Analytics Association Conference (OSUSAAC), Columbus, United States, 2020. (*Best Research Award*)

- **S. R. Behera** and V. S. Vedula, *Video Data Do More. Tracking Data Do Much. Text Commentary Data Do Much More*, Carnegie Mellon Sports Analytics Conference (CMSAC), Pittsburgh, United States, 2020.

Projects

- **Spectral Clustering Using Convex and Constrained Settings**: Proposed framework to incorporate pairwise constraints into semi-definite spectral clustering. Extended it to active and self-taught learning settings (Matlab)
- **Community Detection Using Greedy Plex Algorithm**: Proposed a community detection algorithm (C++)
- **Virtual Learning Environment**: Implemented an e-learning system (HTML, PHP, JavaScript, and MySQL)
- **Web Search Engine**: Built a web search engine (Python, HTML, PHP, and JavaScript)

Programming Skills

- **Languages**: Python, R, C, Matlab, SQL
- **Others**: PyTorch, FastText, spaCy, Flair, AllenNLP, TextBlob, Core NLP, Gensim, NLTK, Huggingface, Fairseq, Pandas, NumPy, SciPy, Scikit-learn, Seaborn, Matplotlib, Plotly, R Shiny

Miscellaneous

- **Best Research Award**: Ohio State Sports Analytics Association Conference (OSUSAAC), 2020, Columbus, USA
- **GATE 2013**: All India Rank 696 (99.68 percentile)
- **Program Committee Member**: ECML-PKDD 2020
- **Reviewer**: IEEE VIS 2020, IEEE VIS 2021, IEEE VIS 2022
- **Grants and Fellowships**: MHRD Government of India Fellowship for MTech and PhD
- **Organizer**: Advaya 2015, PG cultural festival at IIT Guwahati
- **Technical Officer**: Student gymkhana council 2014-2015 at IIT Guwahati

Interests

Cricket, Biking, Movie Making, Personal Productivity, Modern Family (TV Series), Sports Analytics