

# Puneet Kumar

Ph.D. Research Scholar,  
Machine Intelligence Lab,  
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## OBJECTIVE

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I am a Ph.D. student at Machine Intelligence Lab, IIT Roorkee, India, supervised by Prof. R. Balasubramanian. My major research interest is Multimodal Emotion Analysis using Image, Text, and Speech. I am seeking a research position at a multi-disciplinary academic research lab that offers professional growth and innovation, where I could utilize and expand my skills and experience.

## EDUCATION

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- Ph.D.**, Computer Science (pursuing), CGPA: 9.00/10 Jul 2018 onwards  
Indian Institute of Technology, Roorkee, Uttarakhand, India.  
Thesis Area: *Multi-modal Emotion Analysis*  
Supervisor: Prof. R. Balasubramanian
- M.E.**, Computer Science (**Gold Medalist**), CGPA: 9.38/10 Jul 2018  
Thapar Institute of Engineering & Technology, Thapar University, Patiala, Punjab, India.  
Thesis Topic: *Meta-heuristic based Optimization of Deep Neural Networks*  
Supervisor: Dr. Shalini Batra
- B.E.**, Computer Science, CGPA: 7.47/10 May 2014  
Manipal Institute of Technology, Manipal University, Manipal, Karnataka, India.

## WORK EXPERIENCE

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### Industry:

- Visiting Researcher** Jul 2018 - Jun 2019  
*Samsung R&D, New Delhi, India.*  
Worked on 'End to End Emotional Speech Synthesis' project, sponsored by Samsung R&D, in the investigation of Prof. R. Balasubramanian, IIT Roorkee.
- Application Engineer** May 2014 - May 2016  
*Oracle India Pvt. Ltd., Hyderabad, Telangana, India.*  
Worked with the Software Development team for the sustenance of a project management tool 'Oracle Primavera P6 Professional'.
- Project Intern** Jan 2014 - May 2014  
*Oracle India Pvt. Ltd., Hyderabad, Telangana, India.*  
Worked with the Software Testing team for the quality assurance of 'Oracle Primavera P6 Enterprise Project Portfolio Management Web'.

## Academics:

### Visiting Researcher

Dec 2019

*Osaka Prefecture University (OPU), Osaka, Japan.*

Worked at the Department of Computer Science and Intelligent Systems, OPU, Osaka, Japan, under Japan Science and Technology Sakura Science Plan.

### Teaching Assistant

Jul 2018 - Present

*Indian Institute of Technology, Roorkee, India.*

Assisted Prof. R. Balasubramanian in tutorial and quiz sessions for Advance Algorithms (CSN 501), Database Management System (CSN 351), Data Structures (CSN 102), and Discrete Structures (CSN 106) courses.

### Teaching Assistant

Jul 2016 - Jul 2018

*Thapar Institute of Engineering & Technology, Thapar University, Patiala, Punjab, India.*

Assisted Prof. R. K. Sharma and Dr. Shalini Batra in lab and quiz sessions for Data Structures and Algorithms (UCS 406) and Compiler Construction (UCS 802) courses.

## RESEARCH INTERESTS

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- Multimodal Emotion Analysis & Affective Computing
- Machine Learning & Deep Learning
- Image-Text-Speech Processing
- Metaheuristic Optimization Techniques

## PUBLICATIONS

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### Journals

- [J-1] **Puneet Kumar**, Balasubramanian Raman. “A BERT Based Dual-Channel Explainable Text Emotion Recognition System.” Elsevier Neural Networks (NeuNet) Journal. [**SCI, Q1, IF = 8.05**]
- [J-2] **Puneet Kumar**, Shalini Batra, Balasubramanian Raman. “Deep neural network hyperparameter tuning through two-fold genetic approach.” Springer Soft Computing (SoCo) Journal. [**SCI, Q2, IF = 3.05**]
- [J-3] Ankit Sharma, **Puneet Kumar**, Vikas M, Nagasai M, Kishore K, Sriram K, Balasubramanian Raman and Partha Pratim Roy. “Fast Griffin Lim based Waveform Generation Strategy for Text-to-Speech Synthesis.” Springer Multimedia Tools and Applications (MTAP) Journal. [**SCI, Q2, IF = 2.31**]
- [J-4] **Puneet Kumar**, Sahil Garg, Amritpal Singh, Shalini Batra, Neeraj Kumar and Ilsun You. “MVO-Based 2-D Path Planning Scheme for Providing Quality of Service in UAV Environment.” IEEE Internet of Things Journal. [**SCI, Q1, IF = 9.94**]

### Conferences

- [C-1] Sarthak Malik, **Puneet Kumar**, and Balasubramanian Raman. “Towards Interpretable Facial Emotion Recognition.” 12th Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2021), Jodhpur, India [**IAPR Endorsed**].

- [C-2] **Puneet Kumar**, Vishesh Kaushik and Balasubramanian Raman. “Towards the explainability of Multimodal Speech Emotion Recognition.” 22nd Annual Conference of the International Speech Communication Association (Interspeech 2021), Brno, Czech Republic [**CORE A|Qualis A1**].
- [C-3] **Puneet Kumar**, Vedanti Khokher, Yukti Gupta and Balasubramanian Raman. “Hybrid Fusion Based Approach for Multimodal Emotion Recognition with Insufficient Labelled Data.” 28th IEEE Int. Conference on Image Processing (ICIP 2021), Anchorage, Alaska, USA [**CORE B|Qualis A1**].
- [C-4] **Puneet Kumar** and Balasubramanian Raman. “Domain Adaptation based Technique for Image Emotion Recognition using Image Captions.” 5th IAPR International Conference on Computer Vision and Image Processing (CVIP 2020) [**IAPR Endorsed|Got the ‘Best Paper Award’**].
- [C-5] **Puneet Kumar**, Sidharth Jain, Balasubramanian Raman, Partha Pratim Roy and Masakazu Iwamura. “End-to-end Triplet Loss based Emotion Embedding for Speech Emotion Recognition.” 25th IEEE Int. Conf. on Pattern Recognition (ICPR 2020) [**CORE B|Qualis A1**].
- [C-6] Sourav Sahoo, **Puneet Kumar**, Balasubramanian Raman and Partha Pratim Roy. “A Segment Level Approach to Speech Emotion Recognition using Transfer Learning.” The Asian Conference on Pattern Recognition (ACPR 2019) [**IAPR Endorsed**].
- [C-7] J. Jaiswal, A. Chaubey, B. Reddy, S. Kashyap, **Puneet Kumar**, Balasubramanian Raman and Partha Pratim Roy. “A Generative Adversarial Network based Ensemble Technique for Automatic Evaluation of Machine Synthesized Speech.” The Asian Conference on Pattern Recognition (ACPR 2019) [**IAPR Endorsed**].

## PATENTS & COPYRIGHTS

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1. **Copyright** entitled ‘Deep Neural Network Explainability Technique with Application in Multimodal Emotion Recognition’, Puneet Kumar, Vishesh Kaushik, and Balasubramanian Raman. (Status: **Filed**, Dairy No. 13305/2021-CO/SW & 13261/2021-CO/L).

## AWARDS & SCHOLARSHIPS

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1. **Registration support** from the **Alumni fund, IIT Roorkee** to present a research paper in the 28th International Conference on Image Processing (ICIP), **Alaska, USA**.
2. **Registration support** from CSE Department, IIT Roorkee to present a research paper in the 22nd Annual Conference of the International Speech Communication Association (Interspeech 2021), **Brno, Czech Republic, Europe**.
3. **Registration support** from **Microsoft Research Grant** to present a research paper at the 25th IEEE International Conference on Pattern Recognition (ICPR 2020), **Milan, Italy, Europe**.
4. Received the **Best Paper Award** in the 5th IAPR International Conference on Computer Vision & Image Processing (CVIP’20).
5. Got selected to visit Osaka Prefecture University, Osaka, Japan under Japan Science and Technology **Sakura Science Plan** from 4-18 December 2019; received **travel support** from **Osaka Prefecture University, Japan** for the same.

6. **Travel support** from CSE Department, IIT Roorkee to attend 4th Summer School on Machine Learning and Computer Vision at the International Institute of Information Technology (IIIT) Hyderabad, India in July 2019.
7. **Travel support** from CSE Department, IIT Roorkee to attend the 11th Indian Conference on ‘Computer Vision, Graphics and Image Processing’ (ICVGIP 2018) at IIIT Hyberabad and the Indian School of Business (ISB) Hyderabad, India in December 2018.
8. Received the Institute **Gold Medal** in M.E. (CSE) in Nov 2018.
9. Received **MHRD Scholarships** during M.E. (2016-18) and Ph.D. (2018-22).
10. Qualified CBSE **UGC NET** Computer Science in Nov 2017.
11. Qualified **GATE** Computer Science (Rank 2205, percentile 97.91) in 2016.

## TECHNICAL SKILLS

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Programming Languages	: C/C++ (proficient), Python (proficient), R (proficient), Core Java (acquainted), Pascal (acquainted), Delphi (acquainted).
Development Tools	: MATLAB, TensorFlow, PyTorch, Keras, Anaconda, PyCharm, Spyder, RStudio, Weka, Code::Blocks, Eclipse, Visual Studio.
Database	: Oracle DB server, Oracle XE, Microsoft SQL DB Server, Oracle SQL Developer, Microsoft SQL Management Studio.
Web Development	: HTML, CSS, PHP (acquainted), JavaScript (acquainted).
Others	: LaTeX, Rattle, Oracle P6 EPPM, Microsoft Project, Microsoft Azure, Android Development (prior experience).

## WORKSHOP/TRAINING/CONFERENCES ATTENDED

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1. IEEE 27th ‘Int. Conference on Image Processing’ (ICIP), Abu Dhabi, UAE. Oct 2020.
2. IEEE 22nd International Workshop on ‘Multimedia Signal Processing’ (MMSP), Tampere, Finland. Sep 2020.
3. Visited Osaka Prefecture University, Osaka, Japan under Japan Science and Technology Sakura Science Plan. Dec 2019.
4. 4th International Conference on ‘Computer Vision and Image Processing’ (CVIP), MNIT Jaipur. Sep 2019.
5. 4th Summer School on Machine Learning and Computer Vision, IIIT Hyderabad. July 2019.
6. Technical Session on ‘Microsoft Azure Cloud Computing Platform’, IIT Roorkee. Apr 2019.
7. 11th Indian Conference on ‘Computer Vision, Graphics and Image Processing’ (ICVGIP), IIIT Hyderabad. Dec 2018.
8. Workshop on ‘Computer Vision and Image Processing’, IIT Roorkee. Mar 2018.
9. Short term course on ‘Deep Learning and Applications’, IIT Kanpur. Jan 2017.

## TALKS/WORKSHOPS DELIVERED

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1. Organized a training session on 'Deep Learning basics' during 'The Workshop On Computer Vision And Image Processing (WCVIP)' at IIT Roorkee. Dec 2020.
2. Organized a training session on 'Dimensionality Reduction Algorithms' during the workshop on Digital Image Processing & Applications (DIPA) at NIT Arunachal Pradesh. Aug 2020.
3. Conducted a training session on 'Classification Algorithms using Python' during the 'Winter FDP on AI and Machine Learning' at E&ICT Academy, IIT Roorkee. Dec 2019.
4. Organized a training session on 'sequence-to-sequence learning' during the course 'Deep Learning and Applications' at E&ICT Academy, IIT Roorkee. Aug 2019.
5. Organized a workshop on 'Deep Learning 101' during Thapar Summer School 2018 at Thapar Institute of Engineering and Technology, Patiala, Punjab. Jun 2018.

## ACTIVITIES

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**Research Paper Reviewer:** Reviewed research papers in various reputed international journals, including Springer Nature Computer Science (SNCS) Journal and IEEE Communication Letters Journal.

**Memberships of Committees/Clubs:** IEEE student member, Sakura Science Club: OPU Japan, Manipal Cognitive Science Forum, Manipal Photography Club, Thapar Movie Goers Group, Hyderabad Cycling Club, Oracle Volunteers.

**Hobbies:** Travel, Photography, Music, Audiobooks, Personal Finance, Meditation, Exercise & Nutrition, Volunteering, Philosophy, and Psychology.

## PERSONAL DETAILS

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Father's Name	: Late Shri Narayan Kumar	Mother's Name	: Smt. Sushma Rani Babbar
Date of Birth	: Aug 30, 1991	Marital Status	: Married
Nationality	: Indian	Passport No.	: S2140966
Permanent Address: 3-B, Street No. 7, Setia Colony, Ganganagar, Rajasthan, India - 335001.			

## REFERENCES

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Prof. R. Balasubramanian

Professor, CSE Department, Indian Institute of Technology, Roorkee, India.

E-mail: bala@cs.iitr.ac.in

Prof. Anil Kumar Verma

Professor, CSE Department, Thapar University, Punjab, India.

E-mail: akverma@thapar.edu

Prof. Harish SV

Professor, CSE Department, Manipal Institute of Technology, Karnataka, India.

E-mail: harish.sv@manipal.edu