Srijan Das | Curriculum Vitae

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Currently, I am an Assistant Professor in the Department of Computer Science at the University of North Carolina at Charlotte.

Research Interests

My research focuses on video representation learning, utilizing spatio-temporal attention mechanisms, multiple modalities, and both ego-exo centric viewpoints. I am also interested in vision-language models and self-supervised learning techniques. The primary applications of my research include action classification in trimmed videos, temporal action detection in untrimmed videos, video retrieval, robotic vision, and the development of video conversational agents.

Education

- **Université Côte d'Azur (Lab: INRIA, Sophia Antipolis)** — **France**
  Ph.D. Computer Science — *2017–2020*
  Supervisor : Dr. Francois Bremond & Dr. Monique Thonnat
- **National Institute of Technology, Rourkela** — **India**
  M.Tech Computer Science & Engineering , GPA - 9.17/10 — *2015–2017*
- **St. Thomas' College of Engineering & Technology, Kolkata** — **India**
  B.Tech Computer Science & Engineering , GPA - 8.99/10 — *2011–2015*

Current & Previous Employment

- **University of North Carolina at Charlotte** — **USA**
  Computer Science Department, Assistant Professor — *August 2022–Current*
- **Stony Brook University** — **USA**
  Robotics Lab, Postdoctoral Associate — *April 2021–July 2022*
- **INRIA** — **France**
  STARS Team, Researcher — *August 2017–November 2020*
- **INRIA** — **France**
  STARS Team, Masters' Internship — *January 2017–April 2017*
- **National Institute of Technology** — **India**
  Computer Science Department, Teaching Assistant — *July 2016–December 2016*

Projects

- **(PI)** NSF Computer and Information Science and Engineering Research Initiation Initiative (CRII),

'Understanding Activities of Daily Living in Indoor Scenarios', 08.01.2022, $175,000 for 24 months.

- **(Co-PI)** Industry funds from from CorVid Technologies, *'Mechanical and thermal design optimization of multifunctional battery systems'*, 06.01.2023, $39,000 for 24 months.
- **(PI)** UNC Faculty Research Grant 2024, *'Learning Video Representation from First-person and Third-person Views for Elderly Care'*, 07.01.2024, $8,000 for 18 months.
- **(Co-PI)** School of Data Science Summer Seed Grant Program, *'Image Deep Learning Assisted Battery Safety Risk Identification Upon Minor Mechanical Deformation'*, 05.15.2023, $5,000 for 4 months.

Technical skills

- **Programming Languages:** Proficient in: C, C++, Python, Matlab, TeX, Java, R.
- **Packages:** Pandas, Scikit-learn, TensorFlow, Keras, Pytorch

Talks

- Talk on "Computer Vision Projects in CharMLab" in a RoundTable discussion on AI in conjunction with the Defense Alliance of NC (DANC) and the Michael Best Law Firm. (Mar 2024)
- Invited Online Tech Talk on "From Pixels to Robots: Recipes for Vision-Enabled Robot Learning" at Christ University, Bangalore, India. (Feb 2024)
- Invited Talk on "Video Understanding using AI" as part of the "AI and ROS for Robotics: Theory and Practice" short-term training program at IIITDM. (Dec 2023)
- Invited Talk on "Computer Vision for Robot Learning" as part of the "AI and Machine Vision for Robotics" short-term training program at IIITDM. (June 2023)
- Talk on "From Few to More: Enhancing ViT Performance on Limited Data" at PHPC Lab in UNC Charlotte. (April 2023)
- Talk on "From Pixels to Robots: Recipes for Vision-Enabled Robot Learning" at the Seminar on Controls and Robotics in UNC Charlotte. (March 2023)
- Talk on "Quo vadis, computer vision!" at the PhD seminar in UNC Charlotte. (January 2023)
- Invited Talk in AICTE sponsored Short Term Course on "Multiple Modalities are all you need for Video Understanding!" at IIITDM Kancheepuram. (March 17, 2022)
- Talk on "Vision for understanding Activities of Daily Living" at SciTech Talks. (September 4, 2021)
- Seminar talk on "How to combine modalities for understanding Activities of Daily Living? " for CSE 600 at Stony Brook University, NY, USA. (April 30, 2021)
- Seminar talk on "How to combine RGB & Poses for understanding Activities of Daily Living?" at Université Lumière Lyon 2 (November 23, 2020).
- Talk on "Spatio-temporal attention mechanisms for Activities of Daily Living" at Nice Data Science meetup (November 28, 2019)
- Talk on "Activity Recognition for Healthcare" at Summer School Brain Innovation Generation @ UCA (August 30, 2018)

Teaching

- Instructor of ITCS 4152/5152 001 Computer Vision Course at UNC Charlotte in Fall 2022, Spring 2023, Fall 2023 and Spring 2024.
- Conducted 2 Lectures at SKFGI Webinar series 2020 on "Surviving the Deep Learning Apocalypse" (August 2020)
- Conducted 3 Lectures on Deep Learning for Computer Vision at 3IA Cote d'Azur for students of MSc of Data Science and Artificial Intelligence (2019-20)

My Research Team

Current Students

1. **Dominick Reilly** — **Ph.D. Student (Pre-proposal)**
   University of North Carolina at Charlotte, USA — *August 2022–Current*
   Thesis - *Video Transformers for Activities of Daily Living*
2. **Arkaprava Sinha** — **Ph.D. Student (Pre-QE)**
   University of North Carolina at Charlotte, USA — *August 2023–Current*
   Thesis - *Learning spatio-temporal representation for Long Untrimmed Videos*
3. **Rajatsubhra Chakraborty** — **Ph.D. Student (Pre-QE)**
   University of North Carolina at Charlotte, USA — *August 2023–Current*
   Thesis - *Leveraging Foundation Models for Semi-supervised Learning*
4. **Manish Kumar Govind** — **Masters' Student**
   University of North Carolina at Charlotte, USA — *Aug 2023–Current*
   Independent Project - *Effiecient Learning in Vision Transformers*
5. **Sindhu Gadiraju** — **UG Student**
   University of North Carolina at Charlotte, USA — *Jan 2024–Current*
   OUR Program - *Prompt Generation for Video Conversational Models*
6. **Naveen Vellaturi** — **UG Student**
   University of North Carolina at Charlotte, USA — *Jan 2024–Current*
   Independent Study - *Interpretable Video Models*

Past Students

1. **Vishal Bondili**, Masters' Student, UNC Charlotte, USA, May 2023–Dec 2023.
2. **Jonathan Lorray**, Masters' Student, UNC Charlotte, USA, Mar 2023–Dec 2023.
3. **Jacob Nielsen**, Masters' Student, SDU, Denmark, Aug 2022–Aug 2023.
4. **Ian Boyle**, UG Student, UNC Charlotte, USA, Jan 2023–May 2023.
5. **Tanmay Jain**, Remote Intern, UG Student, DTU, India, Aug 2022–Mar 2023.
6. **Soumyajit Karmakar**, Remote Intern, UG Student, IIIT Guwahati, India, Aug 2022–Mar 2023.
7. **Shyam Marjit**, Remote Intern, UG Student, IIIT Guwahati, India, Aug 2022–Mar 2023.

Publications

Patents

- **Srijan Das**, Rui Dai, Francois Bremond, Luca Minciullo, Lorenzo Garattoni, Gianpiero Francesca. METHOD FOR RECOGNIZING ACTIVITIES USING SEPARATE SPATIAL AND TEMPORAL ATTENTION WEIGHTS. Publication Number WO/2021/069945, International Application No

PCT/IB2019/001142 (Publication date 04.15.2021).

- **Srijan Das**, Rui Dai, Francois Bremond, Luca Minciullo, Lorenzo Garattoni, Gianpiero Francesca. METHOD AND SYSTEM FOR DETECTING AN ACTION IN A VIDEO CLIP. European Patent Application EP20306343.3, filed in 05/2022 (Patent Pending).

Conferences

- Dominick Reilly, and **Srijan Das**, "Just Add π!: Pose Induced Video Transformers for Understanding Activities of Daily Living", In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, CVPR 2024, in Seattle, June 17-21, 2024.

- Saarthak Kapse*, Pushpak Pati*, **Srijan Das**, Jingwei Zhang, Chao Chen, Maria Vakalopoulou, Joel Saltz, Dimitris Samaras, Rajarsi Gupta, and Prateek Prasanna, "SI-MIL: Taming Deep MIL for Self-Interpretability in Gigapixel Histopathology", In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, CVPR 2024, in Seattle, June 17-21, 2024.

- Aritra Dutta, **Srijan Das**, Jacob Nielsen, Rajatsubhra Chakraborty, and Mubarak Shah, "Multiview Aerial Visual Recognition (MAVREC): Can Multi-view Improve Aerial Visual Perception?", In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition, CVPR 2024, in Seattle, June 17-21, 2024.

- **Srijan Das**, Tanmay Jain, Dominick Reilly, Pranav Balaji, Soumyajit Karmakar, Shyam Marjit, Xiang Li, Abhijit Das, and Michael S. Ryoo., "Limited Data, Unlimited Potential: A Study on ViTs Augmented by Masked Autoencoders", In Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision, WACV 2024, in Waikoloa Village, Hawaii, January 4-8, 2024.

- Rui Dai, **Srijan Das**, Michael Ryoo, Francois Bremond, "Attributes-Aware Network for Temporal Action Detection", In Proceedings of the 34th British Machine Vision Conference, BMVC 2023, United Kingdom, Aberdeen, November 20-24, 2023.

- Pranav Balaji, Abhijit Das, **Srijan Das** and Antitza Dantcheva, "Attending Generalizability in Course of Deep Fake Detection by Exploring Multi-task Learning", In Proceedings of the Workshop and Challenge on DeepFake Analysis and Detection at ICCV 2023, ICCVW 2023, Paris, France, October 2-6, 2023.

- **Srijan Das** and Michael Ryoo, "Cross-modal Manifold Cutmix for Self-supervised Video Representation Learning", In Proceedings of 18th International Conference on Machine Vision Applications, July 25-28 2023. Best Poster Award!

- Saarthak Kapse, **Srijan Das**, and Prateek Prasanna, "CD-Net: Histopathology Representation Learning using Pyramidal Context-Detail Network", In 20th IEEE International Symposium on Biomedical Imaging, ISBI 2023, Colombia, April 18-21, 2023.

- **Srijan Das** and Michael Ryoo, "ViewCLR: Learning Self-supervised Video Representation for Unseen Viewpoints", In Proceedings of the IEEE Winter Conference on Applications of Computer

Vision, WACV 2023, in Waikoloa Village, Hawaii, January 3-7, 2023.

- Jinghuan Shang, **Srijan Das**, and Michael S. Ryoo, "Learning Viewpoint-Agnostic Visual Representations by Recovering Tokens in 3D Space", In Thirty-sixth Conference on Neural Information Processing Systems, NeurIPS 2022, New Orleans, December 2022.

- Xiang Li, Jinghuan Shang, **Srijan Das**, and Michael S. Ryoo, "Does Self-supervised Learning Really Improve Reinforcement Learning from Pixels?", In Thirty-sixth Conference on Neural Information Processing Systems, NeurIPS 2022, New Orleans, December 2022.

- Rui Dai, **Srijan Das**, Kumara Kahatapitiya, Michael Ryoo, Francois Bremond, "MS-TCT: Multi-Scale Temporal ConvTransformer for Action Detection", To Appear in Proceedings of the IEEE Conference on Computer Vision & Pattern Recognition, CVPR 2022, New Orleans, June 19-24, 2022.

- Rui Dai, **Srijan Das**, Francois Bremond, "CTRN: Class Temporal Relational Network For Action Detection", In Proceedings of the 32nd British Machine Vision Conference, BMVC 2021, United Kingdom, Virtual, November 22-25, 2021.

- Rui Dai, **Srijan Das**, Francois Bremond, "Learning an Augmented RGB Representation with Cross-Modal Knowledge Distillation for Action Detection", In Proceedings of the IEEE International Conference on Computer Vision, ICCV 2021, Virtual, October 11-17, 2021.

- Snehasis Majhi, **Srijan Das** and Francois Bremond, "DAM: Dissimilarity Attention Module for Weakly-supervised Video Anomaly Detection", In Proceedings of the 17th IEEE Int'l Conf on Advanced Video and Signal-based Surveillance, AVSS 2021, video, Virtual, November 16-19, 2021.

- Abhijit Das, **Srijan Das** and Antitza Dantcheva, "Demystifying Attention Mechanisms for Deep Fake Detection", In Proceedings of the IEEE International Conference on Automatic Face and Gesture Recognition, FG 2021, Virtual, Jodhpur, India, December 15-18, 2021.

- Snehasis Majhi, **Srijan Das**, Francois Bremond, Ratnakar Dash and Pankaj Kumar Sa, "Weakly-supervised Joint Anomaly Detection and Classification", In Proceedings of the IEEE International Conference on Automatic Face and Gesture Recognition, FG 2021, Virtual, Jodhpur, India, December 15-18, 2021.

- Rui Dai, **Srijan Das**, Luca Minciullo, Lorenzo Garattoni, Gianpiero Francesca and Francois Bremond, "PDAN: Pyramid Dilated Attention Network for Action Detection", In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV 2021, Virtual, January 5-9, 2021.

- **Srijan Das**, Saurav Sharma, Rui Dai, Monique Thonnat, Francois Bremond, "VPN: Learning Video-Pose Embedding for Activities of Daily Living", In Proceedings of the 16^{th} European Conference on Computer Vision, ECCV 2020, Virtual, August 23-28, 2021.

- **Srijan Das**, Monique Thonnat, Francois Bremond, "Looking deeper into Time for Activities of

Daily Living Recognition", In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV 2020, in Snowmass Village, Colorado, March 2-5, 2020.

- **Srijan Das**, Rui Dai, Michal Koperski, Luca Minciullo, Lorenzo Garattoni, Francois Bremond, Gianpiero Francesca, "Toyota Smarthome: Real-World Activities of Daily Living", In Proceedings of the IEEE International Conference on Computer Vision, ICCV 2019, in Seoul, South Korea, October 27 - November 2, 2019.

- **Srijan Das**, Arpit Chaudhary, Francois Bremond, Monique Thonnat, "Where to Focus on for Human Action Recognition?", In Proceedings of the IEEE Winter Conference on Applications of Computer Vision, WACV 2019, in Waikoloa Village, Hawaii, January 7-11, 2019.

- **Srijan Das**, Monique Thonnat, Kaustubh Sakhalkar, Michal Koperski, Francois Bremond, Gianpiero Francesca, "A New Hybrid Architecture for Human Activity Recognition from RGB-D videos", In Proceedings of the 25th International Conference on MultiMedia Modeling, MMM 2019, in Thessaloniki, Greece, January 8-11, 2019.

- **Srijan Das**, Kaustubh Sakhalkar, Michal Koperski, Francois Bremond, "Spatio-temporal Grids for Daily Living Action Recognition", In Proceedings of the Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP'18, Hyderabad, India, 19-21 December 2018.

- **Srijan Das**, Michal Koperski, Francois Bremond, Gianpiero Francesca, "Deep-Temporal LSTM for Daily Living Action Recognition", In Proceedings of the 14th IEEE International Conference on Advanced Video and Signal-Based Surveillance, AVSS 2018, in Auckland, New Zealand, 27-30 November 2018.

- **Srijan Das**, Michal Koperski, Francois Bremond, Gianpiero Francesca, "Action Recognition based on a mixture of RGB and Depth based skeleton", In Proceedings of the 14th IEEE International Conference on Advanced Video and Signal-Based Surveillance, AVSS 2017, in Lecce, Italy, 29 August - 1st September, 2017.

- **Srijan Das**, Saurav Sharma, Sambit Bakshi, Imon Mukherjee, "A Framework for Pixel Intensity Modulation Based Image Steganography", In Proceedings of International Conference on Advanced Computing and Intelligent Engineering, ICACIE 2016, Bhubaneswar, India, 21-23 December 2016.

- Imon Mukherjee, Biswajita Datta, Reeturaj Banerjee, **Srijan Das**, "DWT Difference Modulation Based a Novel Steganographic Algorithm", In Proceedings of 11th International Conference on Information Systems Security, ICISS 2015, Kolkata, India, 16-20 December 2015.

Journals

- Saarthak Kapse, **Srijan Das**, Jingwei Zhang, Rajarsi R. Gupta, Joel Saltz, Dimitris Samaras, Prateek Prasanna, "Attention De-sparsification Matters: Inducing Diversity in Digital Pathology Representation Learning", In Medical Image Analysis, TPAMI, ISSN: 1361-8415, Digital Object Identifier: 10.1016/j.media.2023.103070, MedIA 2024. (**IF-10.9**)

- Rui Dai, **Srijan Das**, Saurav Sharma, Luca Minciullo, Lorenzo Garattoni, Francois Bremond, Gianpiero Francesca, "Toyota smarthome untrimmed: Real-world untrimmed videos for activity detection", In Transactions on Pattern Analysis and Machine Intelligence, TPAMI, ISSN: 0162-8828, Digital Object Identifier: 10.1109/TPAMI.2022.3169976, PAMI 2022. (**IF-24.3**)

- **Srijan Das**, Rui Dai, Di Yang, Francois Bremond, "VPN++: Rethinking Video-Pose embeddings for understanding Activities of Daily Living", In Transactions on Pattern Analysis and Machine Intelligence, TPAMI-2021-05-0786.R1,ISSN: 0162-8828, DOI: 10.1109/TPAMI.2021.3127885, PAMI 2021. (**IF-24.3**)

- **Srijan Das**, Khan Muhammad, Sambit Bakshi, Imon Mukherjee, Pankaj K Sa, Arun Kumar Sangaiah, Andrea Bruno, "Lip Biometric Template Security Framework Using Spatial Steganography", In Pattern Recognition Letters, 2018.

- **Srijan Das**, Arpita Dutta, Saurav Sharma, Sanghratna Godboley, "A Comparative Analysis of a novel Anomaly Detection algorithm with Neural Networks", In the International Journal of Rough Sets and Data Analysis (IJRSDA) vol. 4, issue 4.

Awards

- **JUL 2023:** Best Poster Award at MVA 2023.
- **JUN 2022:** Secured 2nd-place in Ego4D challenge under the LTA Track at CVPR 2022.
- **DEC 2017 - NOV 2020:** Recipient of National Scholarship from UCA ED STIC.
- **OCT 2019:** Granted Student Travel Award at ICCV 2019.
- **JUN 2018:** Selected in FADEX Program 2018 Edition on Artificial Intelligence 2018.
- **OCT-DEC 2017:** Certificate of Outstanding Reviewer for FGCS and CEE Journal (elsevier).
- **AUG 2015 - JUN 2017:** Recipient of MHRD Scholarship through GATE 2015.
- **AUG 2014:** Cognizant Certified Student

Student's Achievement

- **May 2023:** Dominick Reilly is awarded The Chateaubriand Fellowship. Starting February 2024, Dominick will spend 4 months with the STARS Team at INRIA, Sophia Antipolis, France.

Academic Activities

- Associate Editor for ICRA 2024 in the Area of Vision and Sensor-Based Control.
- Member of the DEI committee for CVPR 2023.
- Member of PhD Review Committee in 2022-23 and Research Committee in 2023-24 at UNC Charlotte.
- Senior Program Committee Member for AAAI 2023 and AAAI 2024.
- Session chair for Image Understanding & Activity Recognition session at IPAS 2020.
- Mentored for B.E.N.J.I. in GirlScript Summer of Code 2019 edition.
- Mentor for the Emerging Technology Business Incubator (ETBI) Led by NIT Rourkela, a platform envisaged to transform the start-up ecosystem of the region.

- Reviewer at ICACIE 2017, 2018, SETIT 2018, KCST 2019, ICAML 2019, AVSS 2019, 2022, WACV 2020, 2021, 2022, 2023, CVPR 2021, 2022, 2023, 2024, ECCV 2022, ICCV 2021, 2023, IROS 2021, NeurIPS 2023.
- Reviewer at TPAMI, Patter Recognition, Elsevier Journal of CVIU, Elsevier Journal of FGCS, Elsevier Journal of Computer & Electrical Engineering, MTAP, and Journal of Signal Processing: Image Communication.
- Volunteer at ICACNI 2014, ICACNI 2016, ICCV 2019, ICLR 2020 & ICML 2020.