VINKLE SRIVASTAV

Senior Researcher (Chargé de recherche R&D) at IHU Strasbourg, France

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PROFESSIONAL EXPERIENCE

Senior Researcher (Chargé de recherche R&D)

IHU Strasbourg, University of Strasbourg

2022 – Ongoing | Strasbourg, France

Senior researcher in the CAMMA group, a collaborative research team between IHU Strasbourg and the University of Strasbourg. Primary responsibilities include advancing novel methods in surgical data science, mentoring PhD students and interns, building collaborations with external labs, and developing novel educational modules to enhance knowledge dissemination in the field.

Research Associate

Dept. of Neurosurgery, AIIMS

2012 – 2017 | Delhi, India

As a team member, contributed to the development of a cost-effective Neuro-Endo-Trainer with real-time video evaluation using computer vision. Developed VR training modules for neuro-endoscopy, incorporating haptic feedback for realistic simulation. Also supported the development of an e-learning platform for neurosurgery education and skills training.

Programmer

Sitarasoft

2011 – 2012 | Delhi, India

Lead programmer for scientific visualization in reservoir modeling project, with expertise in image processing for document analysis, OCR, and number plate recognition.

SUPERVISION EXPERIENCE

Co-supervision with Prof. Nicolas Padoy

2018 – Ongoing | Strasbourg, France

PhD Candidates

1. Idris Hamoud [2020 – ongoing]
   Thesis on "Self-supervised structured learning for robotic operating room workflow monitoring."
2. Kun Yuan [2022 – ongoing]
   Thesis on "Large-scale multi-modality learning for surgical computer vision."
3. Keqi Chen [2023 – ongoing]
   Thesis on "Holistic surgical scene analysis from multi-modal operating room data."
4. Shi Li [2024 – ongoing]
   Thesis on "Multi-modality learning from video & text for large scale surgical video analysis."
5. Farahdiba Zarin [2023 – ongoing]
   Thesis on "Self-supervised video representation learning for surgical video analysis."

EDUCATION

PhD in Computer Science

University of Strasbourg, France

2018 – 2021

Thesis Title: Unsupervised Domain Adaptation Approaches for Person Localization in the Operating Rooms
Research Area: Human pose estimation, unsupervised domain adaptation, self-supervised learning, privacy-preservation.

Master of Science (Research), Computer Science

Indian Institute of Technology, Delhi, India

2014 – 2017

Thesis Title: Computerized evaluation of neurosurgery skills using image processing and computer vision techniques
CGPA: 9.3/10

Bachelor of Technology, Electronics and Communication

Punjab Technical University, Jalandhar, India

2007 – 2011

Division: First with Distinction
Percentage: 85%

TEACHING EXPERIENCE

Université de Strasbourg (Vacataire/CdE)

2024–2025
- 9 hours of TPs, course: "Introduction to AI"
- 21 hours of TPs for the course "Machine Learning and Deep Learning"

2023–2024
- 9 hours of TPs, course: "Introduction to AI"
- 34 hours of TPs, course: "Machine Learning and Deep Learning"

2022–2023
- 35 hours of TPs, course: "Machine Learning and Deep Learning"

2021–2022
- 4 hours of TPs, course: "Deep Learning for Computer Vision"

2020–2021
- 12 hours of TPs, course: "Deep Learning for Computer Vision"
- 4 hours of TPs, practical course: "OpenCV with C++"

2019–2020
- 5 hours of TPs, course: "Deep Learning for Computer Vision"
- 8 hours of TPs, practical course: "OpenCV with C++"

Research Internships

1. Juliette Puel [2025 – ongoing]
   Six months master's research internship on "Developing deep learning approaches for real-time acoustic simulations in therapeutic ultrasound". Joint supervision with Dr. Paolo Cabras.
2. Juan Antonio Barragan [2025 – ongoing]
   Six months doctoral research internship on "Next generation of surgical simulation environments for training and synthetic data generation."
3. Ayush Gupta [2025 – ongoing]
   Six months master's research internship on "Advancing multi-modality learning methods for automated report generation from 3D head and neck cancer medical images." The project is in collaboration with AIIMS, New Delhi, India.
4. Florence Dell'Aniello Picard [2025 – ongoing]
   Six months master's research internship on "Enhanced animal well-being and preclinical research quality."
5. Hadi Hammoud [2024 – ongoing]
   Six months master's research internship on "Exploring video self-supervised learning approaches for advancing 3d medical image analysis."
6. Soham Walimbe [2024]
   Six months bachelor's research internship on "Adaptation of Multi-modal Representation Models for Multi-task Surgical Computer Vision". Joint supervision with Dr. Britty Baby.
7. Lisle Faray de Paiva [2024]
   Six months master's research internship on "Adapting generalist vision language models for surgical phase recognition". Joint supervision with Kun Yuan.
8. Prateek Upadhya [2023]
   Six months bachelor's research internship on "Development of Multimodality Learning Approaches for 3D Medical Imaging". The project is in collaboration with AIIMS, New Delhi, India.
9. Farahdiba Zarin [2023]
   Six months master's research internship on "3D end-to-end mesh reconstruction from pre-operative CT".
10. Aakriti Agrawal [2019]
    Six months bachelor's research internship on "Developing active learning methods for human pose estimation in the OR".
11. Thibaut Issenhuth [2018]
    Six months bachelor's research internship on "Developing deep learning approaches for face detection in the OR".

SELECTED PUBLICATIONS

(Citations: **527**, h-index: **13**, i10-index: **18**)

Book Chapters

- D. Alapatt, P. Mascagni, **V. Srivastav**, and N. Padoy, *NEURAL AND DEEP NETWORKS LEARNING*. McGraw Hill Professional, 2021, p. 59.

Patents

- R. Singh, B. Baby, **V. Srivastav**, *et al.*, *Neuro-endoscope box trainer*, US Patent 10,902,745, Jan. 2021.
- R. Singh, B. Britty, **V. Srivastav**, *et al.*, *Neuro-drill-stencil trainer*, US Patent App. 15/517,773, Nov. 2017.

RESEARCH INTERESTS

Surgical data science, 3D medical image analysis, multi-modal pre-training, Multi-view 3D human pose estimation, self-supervised learning, surgical activity recognition, scientific machine learning, and scientific simulation.

SERVICE & LEADERSHIP

1. Surgical Data Science Summer School

Co-organizer of the Surgical Data Science (SDS) Summer School (https://edu4sds.org) for the past three years, a unique program with a competitive selection rate of $\approx 30\%$. This innovative educational initiative aims to bridge the gap between clinicians and computer scientists, fostering interdisciplinary collaboration at the intersection of medicine and technology.

2. Area Chair & Reviewer

- Area chair for IPCAI 2025, and MICCAI 2025 conferences.
- Member of the award panel for the IPCAI 2023 conference.
- Co-organizer DSAI workshop 2021.
- Program committee member at the ECCV - Medical Computer Vision (ECCV-MCV) workshop 2022.
- Reviewer for conferences:
  MICCAI 2020, 2021, 2022, 2023, 2024
  CVPR 2023, 2024, 2025
  IPCAI 2022, 2023
  ICCV 2025
  AAAI 2025
  ECCV 2022
  ICRA 2022
- Reviewer for Journals:
  TMI IEEE Transactions on Medical Imaging.
  MedIA Medical Image Analysis.
  IJCARS International Journal of Computer-Assisted Radiology and Surgery.
  TNNLS IEEE Transactions on Neural Networks and Learning Systems.

AWARDS

IPCAI 2024 Best paper award (co-author).

IPCAI 2019 Runner-up award in the bench-to-bedside category (co-author).

AIIMS-NBRC Post Graduate Symposium, 2013 Best paper award for "e-learning in neurosurgery".

Journal Articles

- K. Yuan, M. Kattel, J. L. Lavanchy, N. Navab, **V. Srivastav**, and N. Padoy, "Advancing surgical vqa with scene graph knowledge," *IJCARS*, pp. 1–9, 2024.
- S. Ramesh, **V. Srivastav**, D. Alapatt, *et al.*, "Dissecting self-supervised learning methods for surgical computer vision," *Medical Image Analysis*, vol. 88, p. 102 844, 2023.
- K. Yuan, **V. Srivastav**, T. Yu, *et al.*, "Learning multi-modal representations by watching hundreds of surgical video lectures," *arXiv:2307.15220*, 2023.
- **V. Srivastav**, A. Gangi, and N. Padoy, "Unsupervised domain adaptation for clinician pose estimation and instance segmentation in the operating room," *Medical Image Analysis*, 2022.
- T. Issenhuth, **V. Srivastav**, A. Gangi, and N. Padoy, "Face detection in the operating room: Comparison of state-of-the-art methods and a self-supervised approach," *IJCARS*, vol. 14, pp. 1049–1058, 2019.
- P. Jotwani, **V. Srivastav**, M. Tripathi, *et al.*, "Free-access open-source e-learning in comprehensive neurosurgery skills training," *Neurology India*, vol. 62, no. 4, pp. 352–361, 2014.
- M. Tripathi, R. C. Deo, **V. Srivastav**, *et al.*, "Neurosurgery apps: Novel knowledge boosters," *Turkish Neurosurgery*, vol. 24, no. 6, 2014.

Conference Proceedings

- D. Alapatt, A. Murali, **V. Srivastav**, A. Consortium, P. Mascagni, and N. Padoy, "Jumpstarting surgical computer vision," in *MICCAI*, Springer Nature Switzerland Cham, 2024, pp. 328–338.
- I. Hamoud, M. A. Jamal, **V. Srivastav**, D. Mutter, N. Padoy, and O. Mohareri, "St (or) 2: Spatio-temporal object level reasoning for activity recognition in the operating room," in *Medical imaging with deep learning*, PMLR, 2024, pp. 1254–1268.
- J. Hassanpour, **V. Srivastav**, D. Mutter, and N. Padoy, "Overcoming dimensional collapse in self-supervised contrastive learning for medical image segmentation," in *ISBI, Athens, 2024*, 2024.
- **V. Srivastav**, K. Chen, and N. Padoy, "Selfpose3d: Self-supervised multi-person multi-view 3d pose estimation," in *CVPR*, 2024.
- K. Yuan, **V. Srivastav**, N. Navab, and N. Padoy, "Hecvl: Hierarchical video-language pretraining for zero-shot surgical phase recognition," in *MICCAI*, 2024.
- K. Yuan, **V. Srivastav**, N. Navab, and N. Padoy, "Procedure-aware surgical video-language pretraining with hierarchical knowledge augmentation," in *NeurIPS*, 2024.
- **V. Srivastav**, A. Gangi, and N. Padoy, "Self-supervision on unlabelled or data for multi-person 2d/3d human pose estimation," in *MICCAI*, Springer International Publishing Cham, 2020, pp. 761–771.
- **V. Srivastav**, A. Gangi, and N. Padoy, "Human pose estimation on privacy-preserving low-resolution depth images," in *MICCAI*, Springer International Publishing Cham, 2019, pp. 583–591.
- **V. Srivastav**, T. Issenhuth, A. Kadkhodamohammadi, M. de Mathelin, A. Gangi, and N. Padoy, "Mvor: A multi-view rgb-d operating room dataset for 2d and 3d human pose estimation," in *MICCAI-LABELS workshop*, 2018.

All publications: Google scholar

TALKS

HealthTech Day 2024, Strasbourg "Multi-modality learning for automated report generation from 3D medical images in larangyeal cancer."

DSAI 2023, Strasbourg "Dissecting Self-Supervised Learning Methods for Surgical Computer Vision."

EDU4SDS 2023, 2024, Strasbourg "Human pose estimation in the operating room."

DSAI 2022, Strasbourg "Self-supervised multi-view multi-person 3D human pose estimation."

GDR ISIS 2022, Paris "Unsupervised domain adaptation for clinician pose estimation and instance segmentation in the OR."

HealthTech Day 2022, Strasbourg "Self-supervised approaches for human pose estimation in the operating room."

DSAI 2019, Strasbourg "Human pose estimation on privacy-preserving low-resolution depth images."

TECHNICAL SKILLS

Programming Languages C, C++, Python, Matlab.

Deep learning frameworks Pytorch, Tensorflow.

Libraries OpenCV, Armadillo, MathGL, OpenGL, ITK, VTK, VEGA FEM, Chai-3D.

Databases MySQL, SQLite.

Tools LaTeX, Unity 3D, Blender, MeshLab, 3D Slicer, ITK-Snap, CMake.

Web Dev HTML, CSS, JavaScript, Joomla, Moodle, OpenEdx, GitHub Pages, Vite, Jakyll, Hugo.

Hardware Arduino, Raspberry Pi.

MISCELLANEOUS

Badminton, swimming, volleyball, running (completed Paris marathon 2022), biking, hiking.