Himalaya Jain

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Summary

With more than eight years in research, I have worked on representation learning, domain adaptation, semantic segmentation, object detection, knowledge distillation, key-point matching and generative modeling. My PhD work was focused on learning compact representations for large-scale image retrieval and classification. Later as a research scientist, I explored several other domains in machine learning. I am interested in machine learning for visual recognition problems and generative modeling with application on various data modalities.

Professional Experience

- **Helsing** **Paris, France**
  AI researcher *Oct 2021 - till date*

  I have engaged in applied research spanning multiple domains within machine learning including object detection, generative modelling, image matching and 3D computer vision. Due to the confidentiality requirement of Helsing, I am unable to share details.

- **Valeo AI** **Paris, France**
  Research scientist *Jul 2018 - Oct 2021*

  My work was directed towards progressing assistive and autonomous driving. I was particularly involved in exploratory research related to limiting labeled-data needs and transferring the findings to reduce the data acquisition cost.

  – Generative networks: Primarily investigating controlled sampling with GANs. My projects involved feedback-based training-data generation, conditional semantic layout generation, fine-tuning and continual learning for GANs.

  – Domain adaptation: Worked on unsupervised domain adaptation for semantic segmentation task. The work led to two papers at top conferences (CVPR, ICCV).

  – Knowledge distillation: Studied knowledge distillation, and explored the idea of distillation in embedded space. This work is published at ECCV'20.

- **Inria and Technicolor R&D** **Rennes, France**
  PhD researcher *May 2015 - Jun 2018*

  My thesis work is focused on large-scale image search. I primarily worked on supervised deep learning to learn to encode images for efficient image search. The work includes learning a complete indexing and encoding pipeline in supervised manner, which makes it applicable for very large-scale search.

  Pre-doctoral researcher *Dec 2014 - Apr 2015*

  As a pre-doctoral, I have worked on indexing and quantization for approximate nearest neighbor search. I further followed this work during my thesis, and it led to a publication at ECCV'16.

- **Druva** **Pune, India**
  Software engineer *Aug 2014 - Oct 2014*

  Contributed as backend developer in Druva's data backup software. Development was in C++.

- **Cisco systems** **Bangalore, India**
  Software engineer *Aug 2012 - Jan 2014*

  Worked on developing ETL modules using Informatica for data synchronization and transformation. Also, I designed and developed audit, archive & purge and job control mechanism in Python and SQL.

Education

- **University of Rennes 1** — **Rennes, France**
  PhD in Computer Science — *May 2015 - Jun 2018*
  Thesis: Learning compact representations for large scale image search
  Advisors: Dr. Patrick Pérez, Dr. Joaquin Zepeda and Dr. Rémi Gribonval

- **International Institute of Information Technology** — **Hyderabad, India**
  M.Tech in Computer Science — *July 2010 - June 2012*

Publications

- **CSG0: Continual Urban Scene Generation with Zero Forgetting** — **CVPRW'22**
  H. Jain, T.H. Vu, P. Pérez, M. Cord
- **Semantic Palette: Guiding scene generation with class proportions** — **CVPR'21**
  G.L. Moing, T.H. Vu, H. Jain, M. Cord, P. Pérez
- **QUEST: Quantized embedding space for transferring knowledge** — **ECCV'20**
  H. Jain, S. Gidaris, N. Komodakis, P. Pérez, M. Cord
- **This dataset does not exist: training models from generated images** — **ICASSP'20**
  V. Besnier, H. Jain, A. Bursuc, M. Cord, P. Pérez
- **DADA: Depth-aware domain adaptation in semantic segmentation** — **ICCV'19**
  T.H. Vu, H. Jain, M. Bucher, M. Cord, P. Pérez
- **ADVENT: Adversarial entropy minimization for domain adaptation in semantic segmentation (Oral)** — **CVPR'19**
  T.H. Vu, H. Jain, M. Bucher, M. Cord, P. Pérez
- **Learning a complete image indexing pipeline** — **CVPR'18**
  H. Jain, Z. Joaquin, P. Pérez, and R. Gribonval
- **SuBiC: A supervised, structured binary code for image search (spotlight)** — **ICCV'17**
  H. Jain, Z. Joaquin, P. Pérez, and R. Gribonval
- **Approximate search with quantized sparse representations** — **ECCV'16**
  H. Jain, P. Pérez, R. Gribonval, J. Zepeda, and H. Jégou

Skills

Programming Languages: Python, C, C++, MATLAB, Shell
Deep learning tools: PyTorch, PyTorch Lightning, TensorFlow
Software and tools: Weights & Biases, LaTeX, OpenCV

Accomplishments

- Received the best thesis prize (2018) in *University of Rennes 1* in the field of Maths, Science & Informatics.
- Secured 3rd rank in Joint Entrance Screening Test (JEST) 2011 in Computer Science.
- Appeared in the DEAN's list of *IIIT-H* for 1st semester, Aug-Dec 2010.
- Got 99.26th percentile in GATE-2010, entrance exam for the top Indian institutes, in Computer Science.