

# SABYASACHI SAHOO

sabyasachi.sahoo.1@ulaval.ca ◊ sabyasachis.github.io ◊ gScholar ◊  ◊  ◊  ◊  ◊  ◊ en/fr

## EDUCATION

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PhD in Machine Learning Mila, Université Laval, Canada	2021 - Present GPA: 4.33/4.33
Master's in Computational Science Indian Institute of Science - Bangalore, India	2014 - 2016
Bachelor's in Mechanical Sardar Vallabhbhai National Institute of Technology, India	2010 - 2014

## RESEARCH EXPERIENCE

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Research Assistant, Mila & IID, Université Laval Advisor : <a href="#">Christian Gagné</a> and <a href="#">Frédéric Precioso</a> .	2021 - Present
<ul style="list-style-type: none"><li>Broadly work on improving model robustness in real-world deployments. Specifically, I work on test time adaptation, domain generalization, and out-of-distribution detection. I also work on continual learning, adversarial robustness, explainable AI, autonomous driving, and foundational models.</li></ul>	
Research Associate, Machine Learning Lab, IISc Advisor : <a href="#">Chiranjib Bhattacharyya</a>	2019 - 2021
<ul style="list-style-type: none"><li>Worked on unsupervised domain adaptation, model explainability, and 3d computer vision for medical imaging and robotics applications.</li></ul>	
Research Student, Middleware and Runtime Systems Lab, IISc Advisor : <a href="#">Sathish S. Vadhiyar</a>	2015 - 2016
<ul style="list-style-type: none"><li>Worked on scaling molecular dynamics on supercomputers.</li></ul>	

## ENGINEERING EXPERIENCE

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Deep Learning Engineer, Donut Research Labs	2018 - 2019
<ul style="list-style-type: none"><li>Led extreme text classification, text normalization, and object detection projects.</li></ul>	
Software Engineer II, NVIDIA	2016 - 2018
<ul style="list-style-type: none"><li>Led embedded-system display and device tree projects.</li></ul>	

## PUBLICATIONS

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- “Challenges of AI driven diagnosis of chest X-rays transmitted through smart phones: a case study in COVID-19”. [\[pdf\]](#)  
Mariamma Antony, Siva T Kakileti, Rachit Shah, [Sabyasachi Sahoo](#), Chiranjib Bhattacharyya, Geetha Manjunath. (Scientific Reports, Nature ‘23)
- “Differentiable SLAM Helps Deep Learning-based LiDAR Perception Tasks”. [\[pdf\]](#)  
Prashant Kumar, Dheeraj Vattikonda, Vedang Bhupesh Shenvi Nadkarni, Erqun Dong, [Sabyasachi Sahoo](#). (BMVC ‘23)
- “Domain Generalization by Minimizing Out-of-Distribution Detection”. [\[pdf\]](#)  
[Sabyasachi Sahoo](#), Fan Zhou, Yann Pequignot, Jonas Ngnawe, Frédéric Precioso, Christian Gagné. (MAIS ‘22)
- “Fully Differentiable Global SLAM for LiDAR with Pose-Graph Optimization”. [\[pdf\]](#)  
Aryan, Dheeraj Vattikonda, Erqun Dong, [Sabyasachi Sahoo](#). (IROS Workshop ‘22)
- “DSLr: Dynamic to Static LiDAR scan Reconstruction using Adversarially Trained Autoencoder”. [\[pdf\]](#)  
[Sabyasachi Sahoo\\*](#), Prashant Kumar\*, Vanshil Shah, Vineetha Kondameedi, Abhinav Jain, Akshaj Verma, Chiranjib Bhattacharyya, Vinay V. (AAAI ‘21)

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\* equal contribution

## PREPRINTS

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**“Layerwise Early Stopping for Test Time Adaptation”.**

Sabyasachi Sahoo, Mostafa Elarabi, Jonas Ngnawe, Yann Pequignot, Frédéric Precioso, Christian Gagné. [pdf]

**“GROOD: GRadient-aware Out-Of-Distribution detection in interpolated manifolds”.**

Mostafa Elarabi, Sabyasachi Sahoo, Yann Pequignot, Paul Novello, Liam Paull. (2023) [pdf]

**“Hessian Aware Low-Rank Weight Perturbation for Continual Learning”.**

Jiaqi Li, Rui Wang, Yuanhao Lai, Changjian Shui, Sabyasachi Sahoo, Charles X. Ling, Shichun Yang, Boyu Wang, Christian Gagné, Fan Zhou. (2023) [pdf]

**“Test Time Adaptation as an Adversarial Defense Strategy”.**

Kunal Samanta, Sabyasachi Sahoo, Christian Gagne. (2023) [pdf]

**“Diffusion based Pseudolabeling under Distribution Shifts”.**

Apoorva Verma, Sabyasachi Sahoo, Christian Gagne. (2023) [pdf]

**“Test-time Out-of-Distribution Generalization”.**

Sabyasachi Sahoo, Yann Pequignot, Frédéric Precioso, Christian Gagné. (2022) [pdf]

**“Enhancing Explainability in Medical Images using Global Methods”.**

Darshika Tiwari, Rachit Shah, Sabyasachi Sahoo, Chiranjib Bhattacharyya. (2022) [pdf]

**“Adversarial Robustness for Local Interpretable Methods”.**

Gaurav Parashar, Sabyasachi Sahoo, Chiranjib Bhattacharyya. (2021) [pdf]

**“Automated Microservice Extraction using Reinforcement Learning”.**

Sabyasachi Sahoo\*, Khaled Sellami\*. (2021) [pdf]

**“An Approach For Accurate Sceneflow Prediction for LiDAR-based Sensors”.**

Dhiraj Shanbag, Sabyasachi Sahoo, Chiranjib Bhattacharyya, Vinay V. (2020) [pdf]

**“Hierarchical Task Mapping on Dragonfly topology for Scaling Molecular Dynamics”.**

Sabyasachi Sahoo, Sathish S. Vadhiyar. (2016) [pdf]

**“Establishing Semantic relationships among Object Classes using Deep Networks for Image Classification”.**

Sabyasachi Sahoo\*, Vineetha Kondameedi\*. (2015) [pdf]

## ONGOING RESEARCH WORKS

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**“Improving Zero-shot Image Classification with CLIP”.**

Mahtab Sandhu, Sabyasachi Sahoo, Mostafa Elarabi, Yann Pequignot, Samer Nashed, Liam Paull.

**“Local Robustness Evaluation of Deep Neural Networks using Adversarial Perturbations”.**

Jonas Ngnawe, Sabyasachi Sahoo, Yann Pequignot, Frédéric Precioso, Christian Gagné.

**“Test Time Adaptation for Object Detection under Domain Shift”.**

Apoorva Verma, Sabyasachi Sahoo, Christian Gagné.

## PROJECTS

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**“Deep Ensemble Methods for Vehicle Classification”.**

Sabyasachi Sahoo\*, Sara Karami\*, Arman Safarnejadian\*, Adam Tupper\*. (2021) [ppt]

**“DCT-VAE: Capturing Low-level and High-level Features for Image Generation”.**

Tezuesh Varshney, Sabyasachi Sahoo, Chiranjib Bhattacharyya. (2021) [ppt]

**“Improving Automatic Concept Extraction for Global Model Explainability”.**

Sabyasachi Sahoo, Abhinav Jain, Rachit Shah, Chiranjib Bhattacharyya. (2021) [ppt]

**“FAIR : Frugal ADAS for Indian Roads”.**

Vineetha Kondameedi, Santosh Shet, Akshaj Verma, Sabyasachi Sahoo, Prashant Kumar, Chiranjib Bhattacharyya, Soma Biswas. (2020) [pdf]

**“Proximal Pose Search for Adapting SLAM in Dynamic Environments on Slow Moving UGVs”.**

Sabyasachi Sahoo, Prashant Kumar, Vinay V, Chiranjib Bhattacharyya. (2019) [pdf]

## TEACHING AND LEADERSHIP ROLES

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**Teaching Assistant**, Introduction to Machine Learning ('22, '23), Université Laval.

**Organizer**, Out-of-Distribution Reading Group and Machine Learning Reading Group, Mila/Université Laval.

**Research Mentor**, [SHARE Research Labs](#).

**Organizer**, Autonomous Navigation Paper Reading Group, IISc.

**Organizer**, Deep Learning Brainstorming Sessions, Donut Research Labs.

**Placement Coordinator**, IISc.

**Head Coordinator**, Technical Events, SVNIT.

## HONORS AND AWARDS

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- IID Scholarship 2022 [[www](#)]
- Top 5 in class (CDS 2014-16, IISc)
- Distinction for master's thesis
- NIPS 2017 Challenge (1st) [[www](#)]
- SO1 Customer Basket Prediction (3rd) [[www](#)]
- Deep Traffic for the self-driving car (finalist) [[www](#)]