

Pritish Sahu

<https://www.linkedin.com/in/pritishsahu/>

<http://sahupritish.github.io>

pritish.sahu@rutgers.edu / pritish.sahu@gmail.com

EDUCATION

Rutgers University, New Brunswick, NJ, USA

September 2017 – Present

Ph.D. in Computer Science

GPA –3.84/4.0

Advisor: Professor Vladimir Pavlovic

Courses: Pattern Recognition, Theoretical Foundations of Deep Learning (Princeton University), Advanced Algorithms (I, II), Convex Optimization.

Rutgers University, New Brunswick, NJ, USA

September 2015 – May 2017

Master of Computer Science

GPA –3.81/4.0

Courses: Machine Learning, Data Structures and Algorithms, Artificial Intelligence, Computer Vision, Robot Learning, Computer Graphics.

Master Thesis: “**Cube Maze**” under the guidance of **Dr. James Abello**, Rutgers University.

National Institute of Technology, Rourkela, Orissa, India

August 2007 – May 2011

Bachelor of Engineering in Computer Science

GPA – 7.63/10

Undergraduate Thesis: “**Study of approaches to remove show-through and bleed-through in document images**” under the guidance of **Dr. Pankaj Kumar Sa**, National Institute of Technology, Rourkela, India.

PUBLICATIONS

- **Pritish Sahu**, Michael Cogswell, Yunye Gong, Ajay Divakaran, “*Unpacking Large Language Models with Conceptual Consistency*”, arXiv preprint arXiv:2209.15093, 2022.
- **Pritish Sahu**, Kalliopi Basioti, Vladimir Pavlovic, “*DAReN: A Collaborative Approach Towards Visual Reasoning And Disentangling*”, International Conference on Pattern Recognition (ICPR), 2022.
- **Pritish Sahu**, Kalliopi Basioti, Vladimir Pavlovic, “*SAViR-T: Spatially Attentive Visual Reasoning with Transformers*”, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD Oral), 2022.
- **Pritish Sahu**, Karan Sikka, Ajay Divakaran, “*Challenges in Procedural Multimodal Machine Comprehension: A Novel Way To Benchmark*”, Winter Conference on Applications of Computer Vision (WACV), 2022.
- **Pritish Sahu**, Michael Cogswell, Sarah Rutherford-Quach, Ajay Divakaran, “*Comprehension Based Question Answering using Bloom’s Taxonomy*”, Proceedings of the 6th Workshop on Representation Learning for NLP (RepL4NLP-2021) Association for Computational Linguistics (ACL), 2021.
- **Pritish Sahu**, Karan Sikka, Ajay Divakaran, “*Towards Solving Multimodal Comprehension*”, arXiv preprint arXiv:2104.10139, 2021.
- Karan Sikka, Jihua Huang, Andrew Silberfarb, Prateeth Nayak, Luke Rohrer, **Pritish Sahu**, John Byrnes, Ajay Divakaran, Richard Rohwer, “*Zero-Shot Learning with Knowledge Enhanced Visual Semantic Embeddings*”, arXiv preprint arXiv:2011.10889, 2020.
- Behnam Gholami, **Pritish Sahu**, Minyoung Kim, Vladimir Pavlovic, “*Task-discriminative domain alignment for unsupervised domain adaptation*”, ICCV Workshops Multi-Discipline Approach for Learning Concepts (MDALC), 2019.

- Minyoung Kim, **Pritish Sahu**, Behnam Gholami, Vladimir Pavlovic, “*Unsupervised Visual Domain Adaptation: A Deep Max-Margin Gaussian Process Approach*”, Conference on Computer Vision and Pattern Recognition (CVPR Oral), 2019.
- Minyoung Kim, **Pritish Sahu**, Yuting Wang, Vladimir Pavlovic, “*Bayes-Factor-VAE: Hierarchical Bayesian Deep Auto-Encoder Models for Factor Disentanglement*”, International Conference on Computer Vision (ICCV Oral), 2019.
- Minyoung Kim, **Pritish Sahu**, Yuting Wang and Vladimir Pavlovic. “*Relevance Factor VAE: Learning and Identifying Disentangled Factors*”. arXiv preprint arXiv:1902.01568(2019).
- Behnam Gholami, Pritish Sahu, Ognjen Rudovic, Konstantinos Bousmalis, Vladimir Pavlovic. “*Unsupervised Multi-Target Domain Adaptation: An Information Theoretic Approach*”. arXiv preprint arXiv: 1810.11547(2019).
- Sejong Yoon, Mubbasir Kapadia, **Pritish Sahu**, Vladimir Pavlovic, “*Filling in the blanks: reconstructing microscopic crowd motion from multiple disparate noisy sensors*”, Applications of Computer Vision Workshops (WACVW), 2016 IEEE Winter.

PATENTS

- Ajay Divakaran, Karan Sikka, Yi Yao, Yunye Gong, Stephanie Nunn, **Pritish Sahu**, Michael Cogswell, Jesse Hostetler, Sara Rutherford-quach, “*System and method for content comprehension and response*”, US Patent App. 17/516,409, 2022.

WORK EXPERIENCE

Summer Internship

SRI International, Princeton, May-August, (2020, 2021, 2022)

- Worked on teaching AI multi-modal machine comprehension for recipe data. Work led to two publications: **Challenges in Procedural Multimodal Machine Comprehension: A Novel Way To Benchmark, Towards Solving Multimodal Comprehension.**
- Analyzed pretrained large language models (e.g. GPT) for underlying knowledge in them such as the existence of hierarchy like Bloom’s Taxonomy and consistency in learned concepts. Work led to publications: **Comprehension Based Question Answering using Bloom’s Taxonomy, Unpacking Large Language Models with Conceptual Consistency.**

Summer Internship

Triveni Digital Inc, USA, May 2016-August 2016

- Implemented Wireshark decoder for Triveni protocols using Lua & C.
- Build Web Portal for Triveni using JavaScript, HTML/CSS, Java, Servlet Framework and Apache-Tomcat Server.

Senior Software Engineer

Samsung R&D, India, June 2011-July 2015

- Optimized Graphics library for Samsung FullHD (1920x1080) & UHD (3840x2160) TV having GPU & without GPU.
- Client-Server architecture of texture creating on the CPU side and rendering using GPU for better performance.
- Contributed to development of Core Graphics library- 2D/3D drawing, various animation support. Implemented X window-graphics window support, memory optimization, interprocess communication.
- WebGL support for Samsung Smart TV browser, unit test case framework to conduct performance & features check.
- Development & Maintenance of On-Screen Keyboard on Samsung Smart TV.

ACADEMIC PROJECTS

- **Web Portal for Master Students in CS (ms.cs.rutgers.edu):** Full Stack portal for CS department with faculty and student information and interactions.
- **Web Application for Minimum Spanning Tree:** Animating algorithm projects “Algorithms Snippets” showcasing Minimum Spanning Tree.
- **Next Word Prediction using Long Short-Term Memory:** Built a language model trained using Recurrent Neural Network (LSTM) to predict the next word in a sentence using Theano. Compared with Bigram, Trigram and, 4-Gram Models to validate the belief that Recurrent Neural Network is better.
- **Fast Trajectory Planning:** Implemented Adaptive A* search planning algorithm in Java/C++ that helps an agent move efficiently from a source to destination and adapt itself when an obstacle occurs in the path.
- **Face, Digit & Character Recognition:** Implemented character recognition by extracting the HU (centroid) moments from images and applied a Nearest Neighbor classifier to classify the test images. For face, digit classification implemented Perceptron, Naive Bayes & MIRA.
- **Objects in Image Classification, Recognition & Detection:** The objective was to locate objects in shelf for the Amazon Pick up Challenge. The Challenge consisted in Object Classification, Detection, and Recognition. We used “SIFT & SVM” and “a Sequential Neural Network” using Theano and Keras for classification. Extracted Surf features to train and test for Detection. Trained on SIFT features and verified used homography and bounding box for Recognition.

ACHIEVEMENTS

- **Piero Zamperoni Best Student Paper Award** presented at ICPR 2022 for “*DAReN: A Collaborative Approach Towards Visual Reasoning And Disentangling*”.
- Received “**Outstanding Programming Application Award**” and “*Outstanding Project Award*” from Computer Science Department at Rutgers University.
- **Samsung Best Project Award:** For successfully implementing Full HD & Smart TV features on Samsung TV.

TEACHING ASSISTANT

Courses: Introduction to Artificial Intelligence (CS440), Discrete Structures I (CS205), Principles of Programming Languages (CS314), Discrete Structures II (CS206), Principles of Information and Data Management (CS336), Data Interaction and Visual Analytics (CS526), Design and Analysis of Computer Algorithms (CS344), Pattern Recognition (CS535), Machine Learning (CS536).

SKILLS

Languages: Python, Java, C++, C, Matlab, JavaScript(D3.js, Tween.js, Bootstrap), HTML, CSS.

Machine Learning/Vision Libraries: Pytorch, TensorFlow, Keras, OpenCV.

Tools: Apache-Tomcat Framework, Django Framework, Makefile, Servlet, Eclipse, Visual Studio, MySQL, OpenGL/WebGL, Wireshark, Unity, ARM StreamLine.