Raunak Sinha

Staff Research Engineer · Artificial Engineer

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Education

Indraprastha Institute of Information Technology (IIIT) Delhi, India — **GPA: 8.27/10**

BTech. Computer Science and Engineering — *Aug. 2015 - May. 2019*

Army Public School, Dhaula Kuan, New Delhi, India — **95%**

All India Senior School Certificate Examination, CBSE — *Apr. 2014 - Apr. 2015*

Publications

NeurIPS 2019 **R. Sinha**, A. Sankaran, M. Vatsa, R. Singh; AuthorGAN: Improving GAN Reproducibility using a Modular GAN Framework. MLSys: Workshop on Systems for ML [paper]

WACV 2020 (Under Review)

ACL 2020 (Under Review)

Research Experience

Understanding Programming Language Semantics — IBM Research

Staff Research Engineer, Artificial Intelligence — *Jul 2019 - Present*

- Understanding code semantics using machine learning. Part of IBM Research's challenge on AI for code
- Accomplishing Natural Language Code Seach, by learning joint latent space for code and natural language (English). Improving retrieval accuracy, by novelly of using siamese networks. Construction a programming language agnostic framework

IBM GAN-Toolkit — IBM Research

Research Intern — *May. 2018 - Dec. 2018*

- Developed the IBM GAN-Toolkit for code-less authoring of GANs. Formalized novel 'abstractive' view of GAN framework, which unifies various GANs. Unification allows users to commix different GAN components
- Integrated support for multiple libraries: PyTorch, Keras and Tensorflow. Constructed GUI, command line and configuration-file control
- Presented work at IEEE Deep Learning Bootcamp. Work accepted at NeurIPS 2019 [Open-source]

Book2Movie — IBM Research, Image Analysis and Biometrics Lab - IIITD

Undergraduate Researcher — *Aug. 2018 - Dec 2018*

- Generated image sequence as video frames from text descriptions. The learned transformation from text to image space while capturing an understanding of both
- Explored Sequential Generative Adversarial Networks (GANs) for understanding hierarchical semantics of text and image-frame relations. Worked on updating RL based optimisation

Bachelors Thesis — Image Analysis and Biometrics Lab - IIITD

Undergraduate Researcher, Advisors: Dr Mayank Vatsa and Dr Richa Singh — *Jan. 2018 - May. 2019*

- Established research statement on generating family (kin) face images for an individual
- Explored hierarchical and generative models for learning kin face feature hierarchy
- Formalised FamilyGAN, a new GAN framework with updated training and optimisation function to observe feature hierarchy during generation

Teaching Experience

Natural Language Processing — IIITD

Teaching Assistant — *Aug. 2018 - Dec. 2018*

- Constructed, conducted and evaluated the test, quizzes and assignments for a class of 111 students. The cohort consisted of bachelors, masters and PhD candidates
- Designed and delivered tutorials and doubt-sessions for selected topics. Weekly office hours for doubts
- Delegated daily student research showcase on important topics in NLP

Projects

Transferring Adversarial Data Perturbations *Aug. 2018 - Dec. 2018*
Formulated novel algorithm to adapt data perturbations (attacks) across models and data-setsusing transfer learning. Proposed algorithm generated new attacks at faster rates; Framework:PyTorch

Subclass Restricted Boltzmann Machine (RBM) for Facial Retouching *Jan. 2018 - May 2019*
Utilized subclass information to detect facial retouching in images, by incorporating 'L2,1' loss in formulation of Restricted Boltzmann Machines; Framework: PyTorch

Understanding Monocular Simultaneous Localization and Mapping (SLAM) *Jan. 2018 - May. 2018*
Understood PTAM, LSD SLAM and ORB-SLAM algorithms, be evaluating on benchmarkdata-sets. In-dept analysis for success and failure cases; Framework: ROS

noWhinge: Common complaint portal for public grievances *Jan. 2018 - May. 2018*
Built grievance portal for the public using HCI concepts of iterative design, prototype, evaluate. Framework: Python, Javascript, HTML, Django [Blog, Media, Video-Lecture]

Github-Stack Overflow User Recommendation System *Aug. 2017 - Dec 2017*
Built system for recommending users to Github repositories. Used Github and Stack-Overflow profiles along with content topic modelling for features. Language: Python [Open-source]

Predicting Trajectory of Basketball Shots *Aug. 2017 - Dec 2017*
Detected moving basket-ball using advance image analysis techniques for segmentation and extraction. Mapping ball trajectory for predicting shot path; Language: Python and MATLAB

Relevant Courses

Artificial Intelligence	Machine Learning, Statistical Machine Learning, Advance Machine Learning, Natural Language Processing, Computer Vision, Multimedia Computing & Applications, Semantic Web
Algorithm and Theory	Theory of Computation, Analysis and Design of Algorithms, Data Structure and Algorithms
Mathematics	Graph Theory, Discrete Mathematics, Probability and Statistics, Linear Algebra
Other	Image Analysis, Designing Human Centered Systems, Computer Networks, Operating Systems, Fundamentals of Database Systems, Embedded Logic Design

Skills

Languages	Python, C, Java, HTML, CSS, Bash, Embedded C, Verilog, Assembly, SQL
Tools and Technologies	PyTorch, Keras, Tensorflow, Sparql, Kiel Xilinx, Android Studio, EagleCAD, Git , Pandas, OpenCV, SciPy, StarUML

Roles and Responsibility

2019	Student Reviewer, WACV 2020
Jan. 2018 - Aug. 2018	Placement Team, IIIT-Delhi
Aug. 2016 - Mar. 2018	MIS Blackspine Publishing Pvt Ltd
Jun. 2016 - Jul. 2016	Volunteer, Managing database system, NGO Bachpan Bachao Andolan
Apr. 2013 - Apr. 2014	Captain, School Counsel, Army Public School Kolkata