

Subhajit Chaudhury

CONTACT INFORMATION

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RESEARCH INTEREST

My research interest lies at the intersection of reinforcement learning, computer vision and robust machine learning. At IBM Research, I work on reinforcement learning algorithms applied to dialog-based systems and imitation learning from videos. In my Ph.D. thesis, my goal is to develop learning methods in deep neural networks that are robust against adversarial attacks.

EDUCATION

The University of Tokyo, Japan April 2018 - March 2021
Ph.D., EECS, Graduate School of Information Science and Technology
Advised by Prof. Toshihiko Yamasaki
Topic: Robust machine learning against adversarial attacks.

Indian Institute of Technology (IIT), Bombay, India July 2012 - June 2014
M.Tech, Department of Electrical Engineering
GPA: **9.81 out of 10**
Topic: Efficient deformable 3D graphics rendering for real-time Haptics applications.

Jadavpur University, India July 2008 - June 2012
B.E.(Hons.) Department of Electrical Engineering
GPA: **8.90 out of 10 (Rank: 3rd/125)**
Topic: Vision-based indoor structure discovery for locomotion in autonomous robots.

WORK EXPERIENCE

Research Scientist, IBM Research, Tokyo April 2017- Present
Topics: Reinforcement learning in dialog-based systems, adversarial imitation learning from video demonstrations, weakly supervised event detection in sports videos.

Researcher, NEC Central Research Lab, Tokyo Oct 2014- March 2017
Topic: Deep learning-based infrastructure surveillance using computer vision methods. Our vision-based crack detection system was deployed in real-life applications.

Teaching Assistant, IIT Bombay July 2012 - June 2014
Responsibilities: Held recitations, organized exams and evaluated papers for the courses on Signals and System, Digital Signal Processing and Computer Vision.

SELECTED PUBLICATIONS

1) *Subhajit Chaudhury*, Daiki Kimura, Kartik Talamadupula, Michiaki Tatsubori, Asim Munawar and Ryuki Tachibana, **Bootstrapped Q-learning with Context Relevant Observation Pruning to Generalize in Text-based Games**, EMNLP, 2020.

2) *Subhajit Chaudhury* and Toshihiko Yamasaki, **Investigating Generalization in Neural Networks under Optimally Evolved Training Perturbations**, IEEE ICASSP, 2020.

3) *Subhajit Chaudhury*, **Understanding Generalization in Neural Networks for Robustness against Adversarial Vulnerabilities**, AAAI 2020, Ph.D. thesis presentation.

4) Daiki Kimura, *Subhajit Chaudhury*, Minori Narita, Asim Munawar, and Ryuki Tachibana, **Adversarial Discriminative Attention for Robust Anomaly Detection**, IEEE WACV, 2020.

5) *Subhajit Chaudhury*, Daiki Kimura, Phongtharin Vinayavekhin, Asim Munawar, Ryuki Tachibana, Koji Ito, Yuki Inaba, Minoru Matsumoto, Shuji Kidokoro, and Hiroki Ozaki, **Unsupervised Tem-**

poral Feature Aggregation for Event Detection in Unstructured Sports Videos, IEEE ISM, Dec 2019. (Long paper)

6) Daiki Kimura, *Subhajit Chaudhury*, Ryuki Tachibana and Sakyasingha Dasgupta, **Internal Model from Observations for Reward Shaping**, ICML Adaptive and Learning Agents (ALA) 2018; **AAAI** Reinforcement Learning in Games, 2019.

7) Phongtharin Vinayavekhin, *Subhajit Chaudhury*, Asim Munawar, Don Joven Agravante, Giovanni De Magistris, Daiki Kimura and Ryuki Tachibana, **Focusing on What is Relevant: Time-Series Learning and Understanding using Attention**, International Conference on Pattern Recognition (**ICPR**), 2018.

8) Tadanobu Inoue, *Subhajit Chaudhury*, Giovanni De Magistris and Sakyasingha Dasgupta, **Transfer learning from synthetic to real images using variational auto-encoders for robotic applications**, IEEE **ICIP**, 2018.

9) *Subhajit Chaudhury*, Sakyasingha Dasgupta, Asim Munawar, Md. S. Khan and Ryuki Tachibana, **Conditional generation of multi-modal data using constrained embedding space mapping**, **ICML**, Implicit Generative Models, 2017.

10) *Subhajit Chaudhury*, Gaku Nakano, Jun Takada, Akihiko Iketani, **Spatial-temporal motion field analysis for crack detection on concrete surfaces**, IEEE **WACV** 2017.

SKILLS

- **Programming Languages:** *Python, C++, Java*
- **Machine learning Tools:** *Pytorch, Tensorflow, Keras, scikit-learn*
- **Tools:** *Matlab, ROS, Gazebo, OpenCV, CUDA, OpenGL*

AWARDS AND ACHIEVEMENTS

- Won **Scholarship** to present my Ph.D. thesis at **AAAI** in New York, USA.
- Obtained **Best Paper Award** (1st in 126 accepted papers) and **Best Presentation Award** at Symposium on Sensing via Image Information (SSII), 2019.
- Received **Best student paper, honorable mention** (out of 321 papers) at **MIRU 2019**, a top domestic Computer Vision conference in Japan.
- Invited Talk on “*Visual Imitation Learning for Autonomous Control*” at **NASA, Jet Propulsion Laboratory (JPL)**, Dec 2019.
- Secured All India Rank **33 out of 110,125** students in Electrical Engineering, GATE-2012.
- Secured rank **86/80,000** in West Bengal Joint Entrance Examination, 2008 for Engineering.

MEDIA COVERAGE

- My work on weakly supervised rally detection in table tennis videos received multiple media coverage: **Nikkei Voicy**, **Softbank Creative - Business+IT**, **Nikkan Kogyo Shimbun**, **ZDNet** and **Hokkaido Shimbun**. This work is being used by the **Japan Institute of Sports Sciences (JISS)** for training of the national table tennis team.
- My work on vision-based crack detection was used for runway inspection in Japan which was covered by **Nikkei newspaper**.

PROFESSIONAL ACTIVITIES

- Reviewer for ICRA2018, IROS2018, IEEE Transactions on Multimedia (TMM), 2018, IJCAI 2019, ECML-PKDD 2019, ICRA2020, CVPR2021.
- Program Committee member for IJCAI2020, AAAI2020 and KBRL workshop for IJCAI 2020.

EXTRA CURRICULAR ACTIVITIES

- Executive Council member of IIT Bombay Alumni Association in Tokyo from 2015.
- Passed Japanese Language Proficiency Test, N4 level. (Ability have general conversations)
- IIT Bombay swimming club member and participated in various swimming competitions.