

# Arunav Shandeelya

☎ (+91) 7011496262 | ✉ arunavshandilya96@gmail.com | 🏠 shandilya21.github.io | 📷 Shandilya21 | 🌐 arunav-shandilya

## Education

### INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY BHUBANESWAR

BACHELOR OF TECHNOLOGY IN ELECTRICAL & ELECTRONICS ENGINEERING

MINOR SPECIALIZATION IN COMPUTER SCIENCE & ENGINEERING

July 2015 - August 2019

## Publication

### MORE TO DIVERSE: DIVERSIFIED RESPONSE GENERATION IN VISUAL DIALOG [\[JOURNAL PAPER\]](#)

**PLoS ONE**

AUTHORS: **ARUNAV SHANDEELYA**, MAUZAMA FIRDAUS, ASIF EKBAL

- Proposes an end-to-end neural training framework for the objective of generating diverse responses in a visual dialogue setting.
- Build contextual information using a dual encoder with parallel co-attention between modalities, for fine grained representation.
- Leverages stochastic beam search with Gumble Top K-tricks to achieve diversified responses while preserving the content.

### ENHANCING PERCEPTUAL LOSS WITH ADVERSARIAL FEATURE MATCHING [\[ORAL PRESENTATION\]](#)

**IJCNN 2020**

AUTHORS: A. RAVI TEJ, **ARUNAV SHANDEELYA**, S. HALDER, VINOD PANKAJAKSHAN

- Proposes a novel training framework that unifies adversarial and perceptual objectives for high-fidelity photorealistic image generation.
- Leverages additional discriminator supervision to (i) filter the artifacts introduced by perceptual loss and (ii) stabilize adversarial training.
- Presented at **IEEE International Joint Conference on Neural Networks, Glasgow, United Kingdom (IJCNN)**, 2020.

## Research Experience

### AI-NLP-ML LAB INDIAN INSTITUTE OF TECHNOLOGY (IIT) PATNA

**Research Assistant**

SUPERVISOR: **PROF. PUSHPAK BHATTACHARYYA & PROF. ASIF EKBAL**, PROFESSOR, IIT PATNA

July 2019- July 2020

- *Reinforced Character Traits in Dialog Agent:*
  - Propose a novel neural framework PoPe-DG responsible for Polite-Personalized Dialogue Generation.
  - Formulate the objective as controllable dialogue generation capable to variate polite responses according to persona categories.
- *Interpretable Multimodal Fusion:*
  - Developed a block-superdiagonal fusion method to directly control intra-modality and inter-modality dynamics of tensor fusion.
  - Demonstrated superior performance over linear fusion for sentiment analysis on CMU-MOSI dataset (YouTube movie reviews).

### SIGNAL PROCESSING LAB INDIAN INSTITUTE OF TECHNOLOGY (IIT) ROORKEE

**Research Collaboration**

SUPERVISOR: **PROF. VINOD PANKAJAKSHAN**, ASSISTANT PROFESSOR, (IIT) ROORKEE

May 2019-July 2019

- Worked at the intersection of computer vision, machine learning and image forensics (Presented at IEEE-IJCNN 2020).

## Industrial Experience

### EGREGORE LABS

**New Delhi, India**

SOFTWARE ENGINEER - MACHINE LEARNING

Oct 2020 - Sept 2021

- Developed and setup a robust end-to-end OCR engine (tables, form) to process unstructured documents leveraging algorithms and methods from on latest research such as DeepDeSRT, CascadeTabNet, TableNet, etc.
- Deployed efficient, production ready code for (table, form) extraction API and other deliverable modules using Flask framework.
- Design a POC for testing the classification and extraction prototype on unstructured financial documents. Achieved significant improvement in both the module by multiple internal QA and testing on the unknown documents.

### PRICEWATERHOUSECOOPERS (PWC)

**Kolkata, India**

TECHNOLOGY CONSULTANT INTERNSHIP

May 2018-Jul 2018

- Designed a decision insight platform using ML algorithms based on various KPIs, for Finance Cockpit, that add cost-benefits to users and improves vendor selection strategy.
- Contributed in Finance Cockpit Dashboard, to import warning & alerts module for users with reasonable insights predicted by the model.
- Developed a prototype responsible for extracting keywords from scanned PDF documents (for e.g invoices) using dependency parser.

### XEROX RESEARCH

**New Delhi, India**

RESEARCH INTERN

May 2016-Jul 2016

- Worked jointly with GoodEd Tech to test his AI search engine. Contributed in data pipelines while studying classical ML algorithms.
- Designed an User Interface for a courses assignment scheduler using XML and Java, and integrate with an mobile application.
- Recorded videos and develop contents in various computer science modules, to support the financially challenged student in rural areas.

## Projects

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### **POLITE TRAIT VARIATION IN PERSONALIZED DIALOGUE** [RESEARCH PROJECT]

- Design an end to end polite dialogue generation model using human-annotated polite templates according to user profiles to induce polite traits variation.
- Extend Deliberation decoder concept to control the politeness across personalities using gated function.

### **INTERPRETABLE MULTIMODAL FUSION** [RESEARCH PROJECT]

- Developed a tensor fusion method in PyTorch using block-superdiagonal tensor decomposition, and shows a superior performance over linear fusion for personality and sentiment analysis on CMU-MOSI dataset (YouTube movie reviews).

### **END-TO-END COURTEOUS RESPONSE GENERATION IN VISUAL DIALOG** [THESIS]

- Developed an end to end prototype responsible to generate courteous responses in multimodal settings.
- Trained a classifier using stanford politeness corpus to rank dialog utterances based on the degree of politeness.

### **PROTOTYPICAL NETWORKS FOR FEW-SHOT LEARNING** (Finn et al., 2017) [CODE]

- Implementation of Prototypical Networks, MAML for image classification using PyTorch.
- Extends the given function as meta objective for optimizing the image classification model.

### **STOCK MOVEMENT PREDICTION** [CODE]

- Design a predictive model for stock movement by fundamental and technical aspects of financial market using kaggle NYSE dataset.
- Study and implemented different technical indicators including stochastic oscillator, relative strength index (RSI), etc to predict next day stock-prices of 501 stocks listed at NYSE.

### **EXTRACTIVE TEXT SUMMARIZATION** [CODE]

- Design a Extractive text summarization architecture using the concept of Stack RNN.
- Developed (i) 3 window context words and (ii) 5 window context words, to retain the contextual information and returns summary text.
- Reports state of the art accuracy 80%, 77.8% and 71.24% with compression ratios as 41%, 37% and 31% respectively.

## Open Source

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### **ORATIO** [CODE]

- An open source pipeline to translate .mp4 video files to .mov video files in 20 different languages.
- Wrote Python Wrapper for (i) DeepL Translator Client and (ii) Multi-speaker transition (diarization) in video localization pipeline.

## Technical Skills

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<b>Languages</b>	Python, C++, Shell(Basic)
<b>Frameworks</b>	TensorFlow, PyTorch, Keras, NLTK, FAIRSeq, Hugging Face, Scikit-learn, Flask
<b>Scientific and Visualization</b>	NumPy, Pandas, Matplotlib, Plotly
<b>Softwares and IDE</b>	Git, MySQL, Visual Studio, NI Multisim, Xilinx ISE Suit, MATLAB Simulink, Postman
<b>OS and Cloud Services</b>	Windows, Linux, AWS (S3, Poly, Textract, SageMaker, EC2)

## Achievements

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- Ranked **171/2000+** participant in **American Express** Machine Learning Hackathon.
- Ranked Top **200** out of **5.5K** in **Mckinsey Machine Learning** Hackathon.
- Ranked **51 out of 8K** in **Trexquant LLP** Alpha Trading Hackathon.

## References

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### **PROF. PUSHPAK BHATTACHARYYA**

PROFESSOR  
IIT BOMBAY  
[pb@cse.iitb.ac.in](mailto:pb@cse.iitb.ac.in)

### **PROF. ASIF EKBAL**

ASSOCIATE PROFESSOR  
IIT PATNA  
[asif@iitp.ac.in](mailto:asif@iitp.ac.in)

### **PROF. RAKESH BALABANTARAY**

ASSOCIATE PROFESSOR & DEAN (ACADEMICS)  
IIIT BHUBANESWAR  
[rakesh@iiit-bh.ac.in](mailto:rakesh@iiit-bh.ac.in)

### **HARI BALAJI**

CO-FOUNDER, AND CEO  
EGREGORELABS  
[hari@egregorelabs.com](mailto:hari@egregorelabs.com)

### **PROF. VINOD PANKAJAKSHAN**

ASSISTANT PROFESSOR  
IIT ROORKEE  
[vinod.pankajakshan@ece.iitr.ac.in](mailto:vinod.pankajakshan@ece.iitr.ac.in)