

Amit Kumar Singh Yadav

IMAGE PROCESSING · SYSTEMS AND CONTROLS · ROBOTICS · INTERACTION · DEEP LEARNING

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Education

Indian Institute of Technology Gandhinagar

Gandhinagar, India

B.TECH. IN ELECTRICAL ENGINEERING WITH MINORS IN COMPUTER SCIENCE AND ENGINEERING (CPI: 8.96/10) [**degree**]

2016 - 2020

- Course overloaded, early graduated in 7/8 semesters, received **Director's Silver Medal** for overall outstanding performance [**certificate**]

Publications

Amit Yadav*, Kratika Bhagtani*, Girish Chandar*, Nitin Khanna, **PhonePic: A Phone-camera Image Source Identification Dataset**, ACM India Joint International Conference on Data Science and Management of Data (**CoDS-COMAD 2021**) [#]

Akhilesh Ravi*, **Amit Yadav***, Jainish Chauhan*, Jatin Dholakia*, Naman Jain and Mayank Singh, **SentEmojiBot: Empathising Conversations Generation with Emoji**, Online, Student Research Workshop 2021, **EACL-2021** [#]

Adie Tri Hanindriyo, **Amit Yadav**, Tom Ichibha, Ryo Maezono, Kousuke Nakano, Kenta Hongo, **Diffusion Monte Carlo evaluation of disiloxane linearization barrier**, ACS -The Journal of Physical Chemistry A(IF: 2.6) [#] [**preprint**]

Akhilesh Ravi*, **Amit Yadav***, Jainish Chauhan*, Jatin Dholakia* and Naman Jain, **SentEmoji: A Dataset to Generate Empathising Conversations**, ACM India Joint International Conference on Data Science and Management of Data (**CoDS-COMAD 2020**) [**pdf**] [**slides**]

Amit Yadav, Alex Eady, Sara Nabil, Audrey Girouard, **JoyHolder: Tangible Back-of-Device Mobile Interactions**, ACM - Interactive Surfaces and Spaces 2019, Daejeon, South Korea (**ISS 2019**) [**pdf**] [**poster**]

Amit Yadav, **Is Modi's Government All Hype and No Substance?**, Fair Observer, US Library of Congress, Online journal: ISSN 2372-9112 [**pdf**]

* indicates equal contribution, # - manuscript is under review

Awards & Honors

INTERNATIONAL

2018	Awarded JASSO Scholarship , Re-Inventing Japan Project as "Frontier Engineers with Global Sense" (\$3000)	JAIST, Japan
2019	Awarded MITACS Globalink Scholarship , International Research Program for Canada (\$6000)	Ottawa, Canada
2019	Nominated , NTU-India Connect Programme	Singapore
2019	Invited by Digital Media Lab (declined) , University of Bremen, DAAD-WISE Programme	Germany
2019	Student Travel Grant , ACM Interactive Surfaces and Spaces Conference (\$1500)	South Korea
2020	Student Travel Grant , Elsevier Journal on Artificial Intelligence for ACM CODS-COMAD 2020 (\$100)	Hyderabad, India
2020	Student Travel Grant- Full Fellowship , IEEE-VLSI Design and Embedded Design (\$100)	Bangalore, India

DOMESTIC

2020	Director's Silver Medal for Overall Outstanding Performance in Electrical Discipline , IIT Gandhinagar	India
20'14-20	Academic Excellence , Secondary(10/10), Senior Secondary(96.8%), and Dean's list in 4/7 semesters of UG	India
2020	Application Researcher , full-time position in Rakuten India (declined)	India
2019	Special Mention: Among total 51 Research Posters , Undergraduate Research Conclave, IIT Gandhinagar	India
2019	Financial Grant , Research and Development department of IIT Gandhinagar (\$270)	India
2018	Awarded Sri Temasek@IIT Gandhinagar Scholarship , Excellence in leadership skills (\$270)	India
2020	Plaksha Tech Leaders Fellowship , with 75% merit scholarship (declined)	India
2017	Awarded Explorer Fellowship-IIT Gandhinagar , conducted travel-study in 15+ states(10,000+ Km in \$500)	India

Experiences

Embedded Software Engineer

Enphase Energy

Bangalore, India

MANAGER: SSHA NARAYANAN

Aug. 2020 - Present

- Learned cloud enabled energy management system(Ensemble) and embedded system designing
- Developed S/W packages to a) calibrate and control energy metering chips b) set on chip communication with cloud
- Providing S/W packages to a) CTO team for interfacing next generation metering chip b) perform secondary control in 3 Phase Ensemble System

Research Intern

Rakuten Institute of Technology, Rakuten Inc.

Bangalore, India

MANAGER: DR. MADAN DABERRU, MENTOR: DR. PANKAJ WASNIK

Jan. 2020 - Jun. 2020

- Implemented baseline AI algorithms for outfit recommendation, nuclei segmentation, and Table OCR
- Deployed the Size Chart OCR model for production on Rakuten Catalog Platform as a Plugin to increase sales
- Ideated, build & presented PathoAI: interactive AI assistant for Tumour Visualization to CEO India (Received funds for demo to executive team)

Mitacs Globalink Research Scholar

CIL (Creative Interaction Lab), Carleton University

Ottawa, Canada

MENTOR: PROF. AUDREY GIROUARD

May. 2019 - Aug. 2019

- Studied mobile interactions, 3D printing & interfacing tangible sensors, PCB & user study designing
- Conducted user study evaluating tangible back-of-device mobile interactions- touch, rotation, stretching, squeezing, sliding, button and joystick
- Developed a novel tangible Joystick-based back-of-device interactive phone holder

JASSO Research Scholar

Maezono Lab, JAIST- Japan Advanced Institute of Science and Technology

Ishikawa, Japan

MENTOR: PROF. RYO MAEZONO

May. 2018 - Jun. 2018

- Learned bash scripting, architecture of Supercomputers, Gaussian09 and CASINO packages for performing parallel computational calculations
- Successfully performed and manuscripted Post-Hartree Fock, DFT and DMC calculations for Disiloxane using 9 Gaussian basis sets

Visiting Scholar

Gir National Park, Government of India

Sasan Gir, Gujarat

MENTOR: PROF. C.N. PANDEY- CHAIRMAN, MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE

Jul. 2017 - Aug. 2017

- Brainstormed tracking system for tourism vehicles and detecting suspicious activities in an area of 1412 square KM.
- Developed a Proof-of-Concept using a mesh network of GPS-GSM and Zigbee modules live tracking on yahoo digital map scripts.

Postions of Responsibility

2019-2020 **Teaching Assistant- Digital Signal Processing**, Prof. Nithin V. George, IIT Gandhinagar

India

2018-2019 **Student Representative- Institute Senate**, IIT Gandhinagar

India

2017-2018 **Secretary Robotics Club**, Mean Mechanics, IIT Gandhinagar

India

2016-2017 **Core and Conveyor**, Inter College Technical Fest, Ignite3.0 and Ignite 4.0 resp.

India

2017,2019 **Team Leader, National Robotics Competition: eYantra -2017 and 2019**, IIT Gandhinagar Team

India

2017-2018 **Instructor and Coordinator Robotics Workshop**, Technical Council, IIT Gandhinagar

India

2016-2017 **Volunteer and Coordinator**, Drone Racing League(IDRL)-2016 and 2017 resp., IIT Gandhinagar

India

2016-2017 **Sponsorship Team Member, Inter college cultural fest- Blithchron**, Raised 35,000+ USD

India

Projects

A-EYE: An AI-Enabled Drone for Precision Agriculture

IIT Gandhinagar

MENTOR: PROF. JOYCEE MEKEI

Jan. 2019 - Jul. 2019

- Implemented segmentation and localization algorithms, PID flight controller, radio-communication, telemetry and GPS autonomy using ROS
- Devised (in group of 2) an end-to-end novel drone embedded framework for portable, robust and autonomous crop monitoring and localisation
- Tested real-time framework at 50m height (localisation accuracy: 80% and monitoring error-rate: <5%)
- Journal Publication at Institution of Engineering and Technology (IET) (in progress), Author list: Amit Yadav, Kratika Bhagtani, Joycee Mekie

Compression Based Forgery Detection **Presentation**

MANAS Lab, IIT Gandhinagar

MENTOR: PROF. NITIN KHANNA

Dec. 2018 - Jun. 2019

- Studied JPEG pipeline, forgery detection using Double Quantization (DQ) effect, CNN models for multiple JPEG compression detection
- Replicated and Analyzed results of- [Fast, automatic and fine-grained tampered JPEG image detection via DCT coefficient analysis, Patter Recognition] and Surveyed forgery detection using CNN
- Devised a hybrid CNN with Functional Link Artificial Neural Network (FLANN) that outperformed forgery detection for double JPEG compression with similar quantization factors

Phone Camera Brand, Model and Source detection **Presentation**

MANAS Lab, IIT Gandhinagar

MENTOR: PROF. NITIN KHANNA

Jan. 2018 - Apr. 2018

- Studied and implemented: Source Camera Identification from Image Texture Feature, Neurocomputing and Camera Model Identification Using Local Binary Patterns for digital camera brand, model and source detection
- Built (in group of 3) "PhonePic"- a phone camera image data-set with 6000+ photos, 7 phone models and 3 brands
- Achieved over 80% accuracy for brand detection and satisfactory results for model and source detection of phones

Copy-Move Forgery Detection **Repository** **Video Demo**

MANAS Lab, IIT Gandhinagar

MENTOR: PROF. NITIN KHANNA

Jul. 2018 - Dec. 2018

- Studied exhaustive search, auto-correlation, exact-matching, robust-matching and SIFT-based methods
- Implemented and thoroughly replicated results of Improved DCT-based detection of copy-move forgery in images

Empathising Conversation with Emojis **Dataset Paper**

IIT Gandhinagar

MENTOR: PROF. MAYANK SINGH

Jul. 2019 - Dec. 2019

- Studied different empathetic chatbots, text generation methods and emoji classification models
- Published an empathy-dataset-SentEmoji with emoticons and implemented retrieval based BERT and classical deep learning models
- Devised and submitted novel architecture, generating empathetic conversation with emojis: SentEmojiBot

Micro-drone Mimicking Flight of Hungry Bird **Problem Statement Video**

Ministry of Education (MHRD), India

E-YANTRA ROBOTICS COMPETITION 2018

Aug. 2018 - Feb. 2019

- Learned ROS and V-REP, implemented PID controller and flight planning algorithms(in group of 3)
- Real-time emulated indoor environment and localised drone using ArUco and Wycon markers
- Qualified theoretical examinations, simulation rounds and hardware integration rounds -top 100 out of approx. 7000 registered teams

Smart Jacket for Soldier, Defense Research and Development Organization **Report**

IIT Madras

6TH INTERIIT TECHMEET

Jul. 2017 - Jan. 2018

- Lived with Indian Army Battalion at international Bhuj Indo-Pak border (3 days) to do field research and understand contextual use of the jacket
- Built (in group of 4) indoor-outdoor localization, wireless video/image transmission, health tracking and wireless gesture commanding jacket
- Achieved 5th position among 23 IIT's and special appreciation from the director of DRDO for novelty

eBAJA SAE India- Competition for building electric ATV **Vehicle Details**

Natrax Testing Facility, Pithampur

SOCIETY OF AUTOMOTIVE ENGINEERS

Jan. 2018 - Dec. 2018

- Pioneering team-member of the automotive society of IIT-Gandhinagar in eBAJA
- Implemented power transmission(in group of 4) of the electric ATV and sensor-framework for improving safety factor
- Qualified the virtual round and competed in final rounds of eBAJA 2018

Interactive and Tangible Urban Study-Lamp **Prototype Video** **Report** **CAD**

IIT Gandhinagar

PROF. VIKRAM PARMAR AND ASHISH JALOT PARMAR

Oct. 2017 - Dec. 2017

- Researched through design (in group of 4) to counter study-lamp's decreasing use in India among children (5-15 yrs.)
- Conducted field study and owned all embedded system and code development for prototyping the interactive tangible study lamp
- Performed user-study, refined prototype and presented to faculty members of IIT Gandhinagar

Indoor Localisation

IIT Kanpur

5TH INTERIIT TECHMEET 2017

Apr. 2017 - Mar. 2017

- Implemented (in group of 3) RSSI-based trilateration, improved SNR and worked on optimized path planning
- Secured 5th position out of 23 IIT's at 5th InterIIT Technical Meet in Indoor Localisation Event

Note: Experiences include full-time commitment of min 40 hours/week; projects require a commitment of about 12 hours/week

Technical Knowledge

Programming Languages and SuperComputing: Python, C, C++, Verilog, Bash Scripting and Cray XC-40, SGI UV3000

Tools: ROS, V-REP, Git, PyTorch, MATLAB, Simulink, Arduino, Processing, Docker, OpenCV, LabView, Autodesk Inventor, Fusion 360, Audacity, \LaTeX , Mathematica, Quantum Espresso, Gaussian09, Ultimaker filament-based and Formlabs SLA resin-based 3D Printers

Sensors: Proximity(IR and ultrasound), Gesture (flex sensor and hall effect), Health sensor (temperature, humidity, and heartbeat), IoT (Wifi ESP8266), Wireless Communication (Bluetooth- HC06, Radio- Xbee, IR- NEC), HID(BlueSMirf), and GPS-GSM, IMU, LiDAR

Micro-Controller Programming: Arduino- Nano, Beagle, Uno, Mega, Raspberry-Pi, NI-MYRIO, FPGA (Basys3), ARM-Cortex M

Relevant Coursework

At IIT Gandhinagar: Signals, Systems and Networks, Control Theory, Digital Signal Processing, Advanced Signal Processing, Digital Image Processing, Natural Language Processing, Embedded and Microcontroller, Probability and Random Processes, Writing Lab, Differential Equations, Calculus, Linear Algebra [[transcript](#)]

Massive open online courses (MOOCs): Deep Learning Specialization Courses [[certificates](#)]

Social Initiatives

CoShop- delivering essentials during COVID complete lockdown **Portal** **News-Cover**

FOUNDER AND REPRESENTATIVE

- During COVID curfew, Curated and Verified details of 2200+ shops with curfew passes and door delivering essentials in 5 different cities of India
- Developed web page to find details of nearest door-to-door essentials delivering shop, for 2000 regions, launched app with features to order
- 255 families used the portal to get essential delivered during curfew, major impact city-Kanpur, Uttar Pradesh, India

Pep Potential- an initiative to empower youth **Channel**

SCRIPT WRITER AND INTERVIEWER

- Co-founded and build a team of 5 people to create content sharing stories that resonate with youth
- COVID and it's challenges- Reached and Interviewed 6 people on topics like mental health, getting jobs, and keeping oneself productive