KUNAL GUPTA

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EDUCATION

M.S. University of California San Diego, La Jolla, CA
Computer Science (3D Computer Vision) Sept. 18 - June 20
GPA: 3.68/4.0

B.Eng. Birla Institute of Technology and Science, Pilani, India
Electrical and Electronics Engineering (Robotics and Control) May 18
GPA: 8.8/10.0

PUBLICATIONS

Gupta, K., Chandraker, M. "Neural Mesh Flow: 3D Manifold Mesh Generation via Diffeomorphic Flows." NeurIPS 2020 (Spotlight - 4.1% acceptance rate)

RESEARCH EXPERIENCE

Department of Radiology, UC San Diego, CA
Staff Researcher with Prof. Francisco Contijoch June 20 - Present

· Researched memory efficient Neural Rendering algorithm for CT reconstruction capable of producing spatio-temporal dynamic images with 10-15 times less motion artifacts and more details
· Developed Differentiable Renderer for parallel-bean Radon Transform for training neural networks with weak supervision

Centre for Visual Computing, UC San Diego, CA
Research Assistant with Prof. Manmohan Chandraker Jan. 19 - June 20

· Improved 3D mesh reconstruction quality by 50 times over existing methods through researching a novel deep learning algorithm: *"Neural Mesh Flow"* - that leverages NeuralODEs for learning shape diffeomorphism
· Investigated technologies like Shape Auto-Encoders, Graph Convolutional Neural Networks, explicit and implicit shape representations and mesh repair techniques. Published at NeurIPS 2020 (spotlight)
· Composed maintainable Python code utilizing libraries like Pytorch, OpenCV, open3D and ShapeNet dataset

Department of Radiology, UC San Diego, CA
Research Assistant with Prof. Francisco Contijoch June 19 - June 20

· Boosted border segmentation accuracy by 14% via researching 3D deep learning architectures like OctNets, Minkowski Covnets for cardiac CT data
· Maximized memory efficiency over 88% through designing compression algorithms for 3D CT using sparse data representations like Octrees, Sparse Tensors
· Revamped lab's machine learning infrastructure by incorporating Dockers, kubernetes and AWS enabling large scale, robust and rapid AI research
· Collaborated with a diverse interdisciplinary team of radiologists and bio-engineers on a variety of machine learning projects, authored written reports and oral presentations

Wireless Communication Systems Networking Group, UC San Diego, CA
Research Assistant with Prof. Dinesh Bharadia April 19 - June 19

· Evaluated 3 segmentation and pose estimation algorithms for novel bi-directional millimeter radar sensor
· Implemented modified PointNet improve segmentation and pose estimation accuracy by 15%

DroneLab, Contextual Robotics Institute, UC San Diego, CA
Research Assistant with Prof. Falko Kuester Sept. 2018 - Dec. 2018

· Demonstrated drone localization in GPS denied environment based on Ultra-Wide Band RF technology

· Built programs in C, Python based on Mavlink protocol for enabling drone-anchor communication

Bio Robotics Lab, National University of Singapore (NUS), Singapore
Research Intern with Prof. Yu Haoyong June 2017 - Dec. 2017

· Researched control algorithm that integrates seamlessly with rehabilitation robot improving stroke therapy
· Demonstrated on real subjects that control algorithm stops stumbling patient under 1 second
· Programmed sensor fusion via Kalman filter in C to work on real-time embedded Linux system

TALKS

2020 : *"Physically Realizable Representations"* at Center for Visual Computing UC San Diego

OUTREACH AND INCLUSION

2020 : Alumni Career Orientation panel, UCSD CSE Advising
2019 : Diversity and Inclusion panel, UCSD ECE Orientation
2019 : Career Orientation panel, UCSD CSE Advising

HONORS AND AWARDS

2020 : Award of **USD 5000** from UC San Diego School of Medicine to cover tuition related expenses
2018 : Award of **INR 30,000** from IPCD BITS Pilani to cover expenses for Bachelor's Thesis at NUS
2013 : Cleared **Regional Mathematics Olympiad** (RMO) from Chandigarh Region.

TEACHING EXPERIENCE

Winter 2020	WES 237A Intro to Embed System Design (TA)
Fall 2019	CSE 252A Computer Vision I (co-TA)
Spring 2019	CSE 176/276E Robotic System Design and Implementation (TA)

PROFESSIONAL SERVICE AND VOLUNTEERING

NeurIPS 2020 Student Volunteer

REFERENCES

Manmohan Chandraker
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