Sumandeep Banerjee

AI & Engineering Leader

15+ years in the Computer Vision / Machine Learning R&D Industry creating successful commercial products. Experienced in building, mentoring and leading teams. In-depth know how of conceptualizing, designing and deploying scalable live production systems.

Contact Details

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Technical Skills

Advanced:	C/C++, Python, JavaScript
Beginner:	Shell Script, Assembly, Java, Scala, Matlab, HTML5
Frameworks:	OpenCV, Keras, Tensorflow, ROS, PCL, CGAL, OpenMP, CUDA, Apache Spark, NodeJS, WebGL, DirectX, OpenGL, MediaPipe
Source Control:	Git, SVN
Operating Systems:	Linux (preferred), MacOSX, Windows
Cloud Platforms:	GCP, AWS
Project Management:	JIRA, Wrike, Confluence, Notion

Education

2010 - 2014	Ph.D Programme (dropout) Was working towards a thesis on 3D Imaging and Surface Reconstruction Left incomplete to found my own startup **3DPhy** **Indian Institute of Technology**, Kharagpur
2002 - 2007	5 year Dual Degree Programme *Master's* in **Automation and Computer Vision** **Project:** Effects of non idealities on 3D Reconstruction using stripe pattern *Bachelor's* in **Electronics and Electrical Communication Engg.** **Project:** Autonomous / Tele-operated Exploration Robot **Indian Institute of Technology**, Kharagpur
Certifications	Coursera: TensorFlow in Practice Specialization - FGAZZ49M5P8S Coursera: Deep Learning Specialization - 8MN6KFZCKJ2S

Work Experience

May 2021 - present	**Senior Manager AI** at **ShareChat**, Bangalore Owning **Content Creation Technology** and **Content Quality AI** charters. Started both charters as new initiatives, built the team from the ground up. Currently leading a combined team of 25+ ML Scientists, ML Engineers, Software Engineers and Tech Lead Managers **Technologies**: Computer Vision, Deep Learning, EdgeCompute(mobile), Augmented Reality, Video Enhancement, Video Compression & Transcoding
Apr 2020 - Apr 2021	**Founder & Head of Technology** at **Dancejo, SuperMinions AI**, Bangalore

Created innovative technology products to revolutionize Online Dance Learning. Smart practice mirror, AI assisted dance learning, first of it's kind 3D Virtual Studio for live dance classes. Built an awsome team of Problem Solvers, Engineers, and Designers.

Technologies: Computer Vision, Deep Learning, Full Stack Web Development (Node/MongoDB/ReactJS/THREE.js/TFJS), AWS, GCP

Aug 2019 - Mar 2020 | **Senior Robotics Perception Engineer** at **Rapyuta Robotics**, Tokyo

Robot Vision Solutions for Cloud Robotics Platform for industrial and warehouse service robots. Development of vision algorithms for Robot Arms and AMRs in a multi-robot heterogeneous deployment environment.

Technologies: Robot Vision, Computer Vision, Deep Learning, 3D Obstacle Avoidance, Visual SLAM, 3D Object Detection & Localization

Nov 2015 - Jul 2019 | **Principal Machine Learning Engineer** at **Capillary Technologies**, Bangalore

Lead the Computer Vision, Deep Learning and IoT initiative in the company to develop end-to-end products for Customer Activity Monitoring and Shopper Statistics within Brick & Mortar Retail stores using Realtime Video and Audio Analytics.
Responsible for multiple products such as People Counter, Store Heatmap Analysis, Customer Visual Profiling etc. Also minor focus on Machine Learning solutions for Retail Data Intelligence such as List Optimization for SMS/e-mail retail offer campaigns.
Built and managed a team of 12 engineers, collaborated with product managers to create offerings with best market fit.
Generation of intellectual property by the way of **3 US Patent applications** filed and **3 Publications** accepted in international conferences.

Technologies: Computer Vision, Deep Learning, Human Activity Recognition, Face & Demography Recognition, Internet of Things, Embedded Systems, Machine Learning, Cluster Computing, Big Data Analytics

May 2019 | **Guest Faculty** at **Centre of Excellence for Artificial Intelligence**, IIT Kharagpur

Taught two courses **Data Preperation** and **Data Visualization** as part of **Foundations of Artificial Intelligence and Machine Learning** Certification.

Nov 2013 - Sep 2015 | **Co-Founder & CTO** at **3DPhy (Virtual & Augmented Reality Startup - acquired by PropTiger/Makaan/Housing.com)**, Gurgaon

Raised funding of US$200K. **Managed a team of 15 people**. **Lead the Technology Development** at 3DPhy pioneering 3D Scanning of real world objects for e-Commerce listing. Developed the following products:
(1) 3D Visual Modelling tool to create textured mesh models from Image Sequences
(2) Interactive 3D Model renderer for e-Commerce Cataloging on Web/Mobile platform

	(3) 3D Virtual Tour web app developed for Real Estate and Hospitality sector
	Technologies: Virtual Reality, 3D Walkthrough, 3D Reconstruction, 3D Graphics Engine
July 2009 - Nov 2014	**Senior Research Fellow** at **Indian Institute of Technology**, Kharagpur
	Research in field of 3D Reconstruction with applications in Digital Archaeology. Part of "India Digital Heritage (IDH) Initiative" for Department of Science & Technology, Govt. of India and Archaeological Survey of India.
	Developed a **3-D Image Sensor for Capturing Minute Surface Details**. A complete hardware plus software solution able to perform high density **(<0.1mm)** 3-D reconstruction of statues, artifacts etc. using Line Plane Triangulation. It had a laser projector and CCD camera based image sensor for capturing 3-D surface profile along a scan line, along with automated 3D registration and visualization algorithms.
	Technologies: Computer Vision, 3D Reconstruction, Laser Scanning, Digital Archaeology, Computational Geometry, Parallel Computing
Jul 2007 - Jun 2009	**Senior Software Engineer** at **Samsung R & D**, Bangalore
	Prototype development of numerous projects on Computer Vision, Machine Learning, Speech Processing for Multimedia Analysis Team, Advanced Technology Division. Development of algorithms for Face Detection, Hand Gesture based user interaction for Mobile Phones, Speech Recognition for Indian Languages, 2D Barcode reader, Content based Image Search and Retrieval.
May 2006 - Jul 2006	**Guest Researcher** at **Deutsches Forschungszentrum für Künstliche Intelligenz**, Kaiserslautern
	C++ Library for Content based retrieval of Music Videos using K-means Clustering
May 2005 - Jun 2005	**Summer Trainee** at **Sanyo LSI**, Bangalore
	Implemented Spectral Band Replication and Parametric Stereo in C++ on ARM Platform for existing MPEG4 AAC Codec, resulting in the AAC Plus v2 capabilities.

Patent Applications

Jun 2018	PEOPLE DETECTION SYSTEM WITH FEATURE SPACE ENHANCEMENT by Sumandeep Banerjee, Subrat Panda, Doney Alex. Granted 2021 US11151365B2
Jan 2018	PERFORMANCE AWARE OVERHEAD PEOPLE DETECTION by Prashant Maheshwari, Doney Alex, Saurav Behera, Sumandeep Banerjee, Subrat Panda. Granted 2021 US10963680B2
Jul 2017	IN-STORE CUSTOMER TRACKING AND ENGAGEMENT SYSTEM by Aneesh Reddy, Rohan Anil Mahadar, Subrat Panda and Sumandeep Banerjee. Filed US11151365B2

Publications

ICVGIP 2018	Cluster Loss for Person Re-Identification by Doney Alex, Zishan Sami, Sumandeep Banerjee, Subrat Panda In the proceedings of ICVGIP 2018, Hyderabad
ICVIP 2018	Top View person detection and counting for low compute embedded platforms by Prashant Maheshwari, Doney Alex, Saurav Behera, Sumandeep Banerjee, Subrat Panda In the proceedings of ICVIP 2018, Hong Kong
ICVIP 2018	Optimisation of Feature Space for People Detection from Top View on Light Embedded Platform by Doney Alex, Prashant Maheshwari, Sumandeep Banerjee, Subrat Panda In the proceedings of ICVIP 2018, Hong Kong
ACCV 2014	Mesh Denoising Based on Curvature based saliency by S. Dutta, S. Banerjee, P.K. Biswas, P. Bhowmik In the proceedings of ACCV 2014, Singapore
NCVPRIPG 2013	Parallel Mesh Regularization and Resampling Algorithm for Improved Mesh Registration by S. Banerjee, S. Dutta, P.K. Biswas, P. Bhowmik In the proceedings of Fourth National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics 2013, IEEE, Jodhpur
NCVPRIPG 2013	Mesh denoising by improved 3D geometric bilateral filter by S. Dutta, S. Banerjee, P.K. Biswas, P. Bhowmik In the proceedings of Fourth NCVPRIPG 2013, IEEE, Jodhpur
DHIC 2013	A Low-Cost Portable 3D Laser Scanning System with Aptness from Acquisition to Visualization by S. Banerjee, S. Dutta, P.K. Biswas, P. Bhowmik In the proceedings of Digital Heritage International Congress 2013, IEEE, Marseille
WDRHPA 2013	3-D Image Sensor for Capturing Minute Surface Details and Visualization by Geometric Modeling by S. Banerjee, S. Dutta, P.K. Biswas, P. Bhowmik In the proceedings of Workshop on Digital Restoration of Heritage Paintings and Artifacts 2013, Indian Statistical Institute, Kolkata

Awards and Distinctions

2016	**1st Prize** in Mobility Track of **Sequoia Capital Hackathon 2016**, Bangalore. Built speed bump and bad roads warning plugin to Google Maps.
2006	Won **Best Applied Technology Project** in the **Engineering Fair 2006** held at the Birla Industrial and Technological Museum, Kolkata, India.
2005	Founder of **Technology Robotix Society** at Indian Institute of Technology Kharagpur.
2004	**2nd prize** in the **IEEE INDICON Student Design Contest 2004**. Designed a web based control for intelligent buildings.

Additional Projects

More at github.com/sumandeepb