# Manasi Datar

image analysis | AI | computer vision

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 Bengaluru, India
 Personal Work

### Summary

I head the AI India team at Siemens Healthineers, with experience in the areas of image analysis, statistical modeling, and artificial intelligence (DL/ML). My expertise in research methodology and technical project management combine to drive innovation and positive outcomes across multiple projects.

#### EDUCATION

2013	PhD, Computing @ University of Utah
2008	Dissertation : Statistical analysis of ensembles of nonregular shapes 亿
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2005	MS, Computer Science @ Utah State University
2002	Thesis : Natural Scene Segmentation using Information Fusion and Hierarchical Self-Organizing Maps 🗹 🛛
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2002	BE, Computer Engineering @ University of Mumbai
1998	

#### EMPLOYMENT

- 2024	Head of Artificial Intelligence India @ Siemens Healthineers (Digital Technology & Innovation)
2024	Senior Specialist, Research & Technology @ Siemens Healthineers (Digital Technology & Innovation)
2023	Topics : DL/ML, image segmentation, uncertainty quantification, technical project management
2023	Research Scientist @ Siemens Healthineers (Digital Technology & Innovation)
2014	Topics : DL/ML, image segmentation, pathology detection/characterization, technical project management
2014	Software Developer @ 1000shapes GmbH
2014	Topics : statistical shape modeling, image segmentation, 3D reconstruction, surgical planning
2013	Research Assistant @ University of Utah (SCI Institute)
2008	Topics : statistical shape modeling, shape regression, longitudinal shape analysis
2008	Research Scientist @ GE Global Research (Imaging Technologies)
2005	Topics : ML, image segmentation, multi-modality image registration

#### HONORS AND AWARDS

2023 2020	Siemens Healthineers CEO Performance Stock Award (×4) outstanding performance as an individual contributor in the corresponding FY
2013	Top 10 best poster @ SCIx topic : Shape analysis for Orthopedics
2007	Dushman award @ GE Global Research highest team technical award received for contributions as a part of the PET-VCAR team

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# RESEARCH EXPERIENCE (SELECTED TOPICS)

-	Uncertainty estimation for segmentation
2023	Bayesian methods for epistemic uncertainty estimation Statistical methods for maximal use of in-distribution data to estimate uncertainty metric distribution
	explainable AI Bayesian methods deep ensembles uncertainty estimation technical project management
-	X-ray/mammography/DBT image analysis
2016	Integration of inter-reader agreement for AI based breast density classification
	Low dimensional representation for pectoral muscle segmentation in mammography images
	Knowledge distillation using MLE-based loss weights for model compression and faster inference Explainable AI methods for positioning check in X-ray images
	Intelligent o'clock positioning of breast lesions : C syngo.Breast Care
	explainable AI (image segmentation) knowledge distillation (decision support) technical project management)
2023	Multi-modal analysis for oncology
2021	Prediction of pancreatic cancer progression and survival using longitudinal imaging studies
	Therapy response prediction by combining baseline imaging and clinical data for colorectal cancer
	Project pages : C EuCanImage website PANCAIM website
	artificial intelligence pathology detection/characterization response/survival prediction technical project management
2019	Intelligent organ contouring for radiation therapy
2017	Evaluation of DL model for automatic organ contouring
	Methods for semi-automatic, interactive editing of organ contours
	Reinforcement learning to improve contour accuracy based on user intent
2017	Analysis of pediatric cardiomyopathies and cardiovascular disease risk
2014	ML based structural segmentation of for personalized cardiac modeling
	DL based deformable registration via shape matching Bersonalized cardias models for longitudinal analysis of pediatric cardiomyconathics
	Project summary : C MD-Paedigree final newsletter
	deep learning image segmentation deformable registration longitudinal analysis
2012	
2013	Statistical analysis of ensembles of nonregular snapes Modeling highly curved surfaces using isometry invariant correspondences and feature entropy
2000	Constrained models for open surfaces using simple geometric primitives
	Linear shape regression model to characterize shape changes over time
	High-dimensional linear mixed-effects shape model for longitudinal analysis
	Some reactures included in software : Construction Shapeworks
2008	Multi-modality image registration
2006	Fast and efficient multi-modality image registration for assisted reading :
	Constrained deformable image registration based on anatomic material properties
	image registration deformable registration longitudinal analysis
2008	Perceptually consistent image segmentation
2003	nerarchical sen-organizing map architecture for segmentation using color and texture features Application to automated image orientation detection, tissue segmentation for prostate cancer analysis
	machine learning [image segmentation] [image classification]

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#### PUBLICATIONS (selected, not all as first author)

- 2024 Towards integrating epistemic uncertainty estimation into the radiotherapy workflow [accepted at MICCAI]
  - Computer-implemented method for providing a positioning score regarding a positioning of an examining region in an x-ray image [EP4345742A1]
  - Method for detection and characterization of lesions [US20240104722A1]
  - Building a machine-learning model to predict sematic context information for contrast-enhanced medical imaging measurements [EP4343786A1]
  - Multi-task machine learning network [EP4339837A1]
  - Improved pectoral muscle segmentation in mammograms through regression-based deep learning and knowledge distillation [ISBI]
- 2023 | AI driven longitudinal liver focal lesion analysis [US20230237647A1]
  - System and method for differentiating a tissue of interest from another part of a medical scanner [US20230079774A1]
  - Integration of Inter-Rater Agreement in Al-System Training and Testing for Mammographic Breast Density Classification [ECR]
- 2022 A deep image-to-image network organ segmentation algorithm for radiation treatment planning : principles and clinical evaluation [RADIAT ONCOL]
- 2017 Longitudinal Analysis using Personalised 3D Cardiac Models with Population-Based Priors : Application to Paediatric Cardiomyopathies [MICCAI]
  - SVF-Net : Learning Deformable Image Registration Using Shape Matching [MICCAI]
  - Longitudinal Parameter Estimation in 3D Electromechanical Models : Application to Cardiovascular Changes in Digestion [FIMH]
- 2016 | Entropy-based particle correspondence for shape populations [IJCARS]
- 2015 Propagation of Myocardial Fibre Architecture Uncertainty on Electromechanical Model Parameter Estimation : A Case Study [FIMH]
- 2013 | Statistical Shape Modeling of CAM Femoroacetabular Impingement [JOR]
  - Geodesic distances to landmarks for dense correspondence on ensembles of complex shapes [MICCAI]
  - Toward an understanding of the short bone phenotype associated with multiple osteochondromas [JOR]
- 2012
   Mixed-Effects Shape Models for Estimating Longitudinal Changes in Anatomy [STIA]

   Combined SPHARM-PDM and Entropy-based Particle Systems Shape Analysis Framework [SPIE-MI]
- 2011 | Geometric Correspondence for Ensembles of Nonregular Shapes [STIA]
  - Segmentation of tissue images using color and texture [US7949181B2]
- 2009 Particle Based Shape Regression of Open Surfaces with Applications to Developmental Neuroimaging [MIC-CAI]
- 2008 Color and Texture Based Segmentation of Molecular Pathology Images using HSOMs [ISBI]
  - Deformable Registration with Spatially Varying Degrees of Freedom Constraints [ISBI]
- 2007 | System and method for geometry driven registration [US20070280556A1]
- 2006- Natural Scene Segmentation Based on Information Fusion and Homogeneity Property [JCIS-CVPRIP]- Automatic Image Orientation Detection Using the Supervised Self-Organizing Map [IASTED SIP]

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