

Sudhir Sornapudi

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Education	Missouri University of Science and Technology (Rolla, MO)	Aug 2020
	Ph.D., Computer Engineering	GPA: 3.8/4.0
	Missouri University of Science and Technology (Rolla, MO)	April 2017
	M.S. Computer Engineering Thesis: Nuclei Segmentation of Histology Images Based on Deep Learning and Color Quantization and Analysis of Real World Pill Images.	GPA: 4.0/4.0
Industry Experience	JNTU Kakinada - University College of Engineering Vizianagaram (India)	May 2014
	B.Tech. Electronics and Communications Engineering	GPA: 3.8/4.0
	MilliporeSigma, Merck KGaA	St. Louis, MO
	Computer Vision Intern	May 2019 – Aug 2019
<ul style="list-style-type: none">▪ Designed a prototype to automatically update digital inventory by scanning images of chemical reagents.▪ Implemented deep learning based text detection and recognition modules to extract information from the labels attached to the chemical reagents.▪ The model helped scientists to onboard and update inventory within seconds.▪ Contributed to Brightlab team at hackathon event by detecting the weights from the images of a digital balance.		
	U.S. National Library of Medicine, NIH, HHS	Bethesda, MD
	Research Scientist Co-op	Aug 2018 – Dec 2018
	<ul style="list-style-type: none">▪ Designed a pipeline to read raw cervical cytology raw slide images and produce clean high-resolution annotated patch data.▪ Implemented a novel graph-based approach to detect nuclei and cell boundaries from complex overlapping cell images.▪ Evaluated and analyzed various CNN models to classify and differentiate abnormal cell images from collection of normal cell images.	
	Xyken LLC	McLean, VA
	Software (Image Processing) Intern	May 2018 – Aug 2018
	<ul style="list-style-type: none">▪ Implemented a customized region-based CNN model for performing instance segmentation and detection on colonoscopy and wireless capsule endoscopy (WCE) polyp frames.▪ Designed a tool to annotate capsule endoscopy videos.▪ Worked on skin segmentation of foot image frames, extracted from a user video, using a deep neural network and Gaussian mixture model to ultimately recreate a 3D model of a foot for foot prosthesis.▪ The skin segmentation approach is directly incorporated in the Xyken's iDr 3D android mobile application.	
	Naval Science & Technological Laboratory, DRDO	Visakhapatnam, India
	Research Intern	Nov 2012 – Dec 2012
<ul style="list-style-type: none">▪ Modeled Pitch Controller of Unmanned Underwater Vehicle (UUV).▪ Implemented the transfer function and carried out the design of linear controller using the standard control system toolbox from MATLAB software.		

Academic Experience	<p>Missouri University of Science and Technology Rolla, MO</p> <p>Graduate Research Assistant, Image Processing Laboratory Nov 2015 – Current</p> <ul style="list-style-type: none"> ▪ Image Analysis and Object Recognition. Perform research into software design and development involving image processing and feature extraction for automated nuclei detection in histology images using novel algorithms involving computer vision and computational intelligence imaging techniques. ▪ Deep Learning and Pattern Recognition. Investigate computational intelligence paradigms for automatic Cervical Cancer image recognition. Develop novel and hybrid artificial intelligence algorithms to improve nuclei identification and epithelium segmentation. Superpixels extraction and classification using Neural Network based on Backpropagation, SVM, Clustering, Deep Convolutional Neural Networks and Recurrent Neural Networks. ▪ Hands on experience with data collection, feature selection, data training and evaluation. <p>Graduate Teaching Assistant, Digital Electronics Laboratory Aug 2016 – Current</p> <ul style="list-style-type: none"> ▪ Taught Digital Logic (CpE 2211) and Microcontrollers (CpE 3151) laboratory course. ▪ Delivered a range of teaching and assessment activities including tutorials for students. ▪ Provided effective timely and appropriate feedback to students to support their learning. ▪ Teaching topics include AVR microcontroller, assembly language programming and embedded C programming; and digital logic design and analysis using Altera Quartus II, Model Sim (firmware) and FPGA (hardware).
Expertise	<p>Solid background in Digital Image Processing, Machine Learning and Statistical Analysis</p> <p>Languages: Python, C, C++, Java, Embedded C, VHDL, HTML</p> <p>Environment's: Linux, Windows, AWS, Visual Studio</p> <p>Tools: Matlab, OpenCV, Scikit-learn, Pandas, Weka, Eclipse, ModelSim</p> <p>DL frameworks: PyTorch, Tensor Flow, Theano, and Keras (GPU enabled).</p> <p>Big Data Analytics: Hadoop, Map Reduce, HBase, MongoDB, Pig, Mahout</p>
Courses	<p>Deep Learning and Advanced Neural Networks/ Adaptive Dynamic Programming/ Mechatronics/ Big Data and Cloud Computing/ Analysis of Algorithms/ ML in Computer Vision/ Advanced Data Mining/ Computational Intelligence/ Machine Vision/ Digital Image Processing/ Machine Learning and Data Mining/ Clustering Algorithms/ Neural Network for Controls/ Probability and Statistics/ Markov Decision Process/ Machine Learning (Coursera)/ Embedded Systems Processor Design</p>
Publications	<p>Sudhir Sornapudi, G. T. Brown, Zhiyun Xue, Rodney Long, Lisa Allen, Sameer Antani. Comparing Deep Learning Models for Multi-cell Classification in Liquid-based Cervical Cytology Images. Accepted to AMIA 2019 Annual Symposium.</p> <p>Sudhir Sornapudi, Jason H., R. Joe Stanley, William V. Stoecker, Rodney Long, Sameer Antani, George Thoma, Rosemary Zuna, Shelliane R. Frazier. EpithNet: Deep Regression for Epithelium Segmentation in Cervical Histology Images. Submitted to Journal of Pathology Informatics.</p> <p>Sivaramakrishnan Rajaraman, Sudhir Sornapudi, Marc D. Kohli, Sameer K Antani. Assessment of an ensemble of machine learning models toward abnormality detection in chest radiographs. In Proceedings of IEEE Engineering in Medicine and Biology Conference (EMBC), Berlin, Germany</p> <p>Sornapudi, S.; Meng, F.; Yi, S. Region-Based Automated Localization of Colonoscopy and Wireless Capsule Endoscopy Polyps. Appl. Sci. 2019, 9, 2404.</p>

Sornapudi, S., Stanley, R. J., Stoecker, W. V, Almubarak, H., Long, R., Antani, S., Frazier, S. R. (2018). Deep Learning Nuclei Detection in Digitized Histology Images by Superpixels. Journal of Pathology Informatics, 9(1), 5. http://doi.org/10.4103/jpi.jpi_74_17

Sornapudi S., Joe Stanley R., Hagerty J. and V. Stoecker W. (2017). Real-world Pill Segmentation based on Superpixel Merge using Region Adjacency Graph. In Proceedings of the 12th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications - Volume 4: VISAPP, (VISIGRAPP 2017) ISBN 978-989-758-225-7, pages 182-187. DOI: 10.5220/0006135801820187

Guo P, Stanley RJ, De S, Long LR, Antani SK, Thoma GR, Demner-Fushman D, **Sornapudi S**; Features Advances to Automatically Find Images for Application to Clinical Decision Support. Medical Research Archives. 4(7) 2016. DOI: 10.18103/mra.v4i7.761

Sudhir Sornapudi, Jason H., R. Joe Stanley, William V. Stoecker, Rodney Long, Sameer Antani, George Thoma, Rosemary Zuna, Shelliane R. Frazier. EpithNet: Deep Regression for Epithelium Segmentation in Cervical Histology Images. Poster presentation at Ozark Biomedical Initiative Symposium, Rolla, MO. September 2019.

William V. Stoecker, Haider A. Almubarak, **Sudhir Sornapudi**, Peng Guo, Jason Hagerty, R. Joe Stanley R.. “Update on Microscopic Image Processing: Detecting Successively Finer Structures – Architectures, Cells, Nuclei”. Poster presentation at Ozark Biomedical Initiative Symposium, Rolla, MO. August 2018.

Sudhir Sornapudi, Joe Stanley R., Hagerty J. and V. Stoecker W. “Real-world Pill Segmentation based on Superpixel Merge using Region Adjacency Graph”. Oral presentation at Ozark Biomedical Initiative Symposium, Rolla, MO. August 2017.

Honors &
Activities

Speaker—Open House held in Electrical and Computer Engineering Dept. at Missouri S&T
Student Assistant—CpE 3150 course (Microcontroller and Embedded Systems)
Missouri S&T Badminton Intramural Champion