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Researcher Profile

Spring 10-1-2022

Design and development of computer-based decision support systems to aid clinicians for screening & early detection of diseases, and better treatment plan.

P C Siddalingaswamy

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P. C. Siddalingaswamy

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Research Interests

Image Processing, Computer Vision, Assistive Technologies in Healthcare.

Education

- 2011 Ph.D. - Manipal Academy of Higher Education, Manipal
Department of Computer Science & Engineering, MIT, Manipal.
- 2003 M.Tech. - Manipal Academy of Higher Education, Manipal
Department of Computer Science & Engineering, MIT, Manipal.
- 2000 B.E. - Kuvempu University, Shivamoga
Department of Electronics & Communications, UBDTCE, Davangere

Research Experience & Funding

Twelve years of research experience in the field of medical image processing and successfully guided 2 Ph.D. students. Worked with experts from Department of Radiology, Dermatology and Ophthalmology on interdisciplinary projects related to automated image analysis for computer aided medical diagnosis and development of home-based monitoring systems. At present I am guiding 3 PhD students.

Received INR 31 lakhs to develop and validate automated home amsler grid (e-amsler) for screening sight threatening eye (macular) diseases, Department of Science and Technology, New Delhi. GRANT_NUMBER: SEED/TIDE/ 015/ 2014

Received INR 18 lakhs to develop virtual Reality based technology for Screening and Monitoring of sight threatening macular diseases, BIRAC, New Delhi, GRANT_NUMBER: BT/SBIRI1498/34/17

Teaching Experience

Nineteen years of academic experience in the Department of Computer Science & Engineering, MIT, Manipal. Following are the few courses I have taught over the years. Computer graphics, Digital image processing, Computer Vision, Neural networks, Artificial Intelligence and Development of Windows Applications, Creativity, Problem Solving, Python Programming, Microprocessors.

Other Responsibilities held

Assistant Director (Faculty Development & Welfare) July 2019 – July 2022
Department Research Coordinator (2022).
Department NBA Co-Coordinator (2013-2017).
MIT Faculty mentor for MAHE SRF (2020 and 2021)
Reviewer of various Journals.

Patent Filed

“System and method for monitoring dermal condition”, has been filed at the Indian Patent Office on 23rd January 2020 with application no. 202041003116.

Journal Publications

Pathan, S., Siddalingaswamy, P. C., & Ali, T. (2021). Automated Detection of Covid-19 from Chest X-ray scans using an optimized CNN architecture. Applied Soft Computing, 104, 107238.

- Pathan, S., Siddalingaswamy, P. C., Kumar, P., Pai M M, M., Ali, T., & Acharya, U. R. (2021). Novel ensemble of optimized CNN and dynamic selection techniques for accurate Covid-19 screening using chest CT images. *Computers in Biology and Medicine*, 137, 104835.
- Manjunath, K. N., Prabhu, G. K., & Siddalingaswamy, P. C. (2020). A quantitative validation of segmented colon in virtual colonoscopy using image moments. *Biomedical Journal*, 43(1), 74-82.
- Pathan, S., Siddalingaswamy, P. C., & Dsouza, N. (2020). Automated detection of pathological and non-pathological myopia using retinal features and dynamic ensemble of classifiers. *Telecommunications and Radio Engineering (English translation of Elektrosvyaz and Radiotekhnika)*, 79(20), 1857-1867.
- Sameena Pathan, K. Gopalakrishna Prabhu and P C Siddalingaswamy, Automated detection of melanocytes related pigmented skin lesions: A clinical framework, *Biomedical Signal Processing and Control*, vol. 51, pp-59-71, 2019
- Sameena Pathan, K. Gopalakrishna Prabhu and P C Siddalingaswamy, Hair detection and lesion segmentation in dermoscopic images using domain knowledge, *Medical & Biological Engineering & Computing*, 2018
- Sameena Pathan, K. Gopalakrishna Prabhu and P C Siddalingaswamy, A methodological approach to classify typical and atypical pigment network patterns for melanoma diagnosis, *Biomedical Signal Processing and Control*, vol. 44, pp- 25-37, 2018
- Sameena Pathan, K. Gopalakrishna Prabhu and P C Siddalingaswamy, Techniques and algorithms for computer aided diagnosis of pigmented skin lesions—A review, *Biomedical Signal Processing and Control*, vol. 39, pp. 237-262, 2018
- K. N. Manjunath, K. Gopalakrishna Prabhu, P. C. Siddalingaswamy, “Measurement of smaller colon polyp in CT colonography images using morphological image processing”, *International Journal of Computer Assisted Radiology and Surgery*, vol. 12, no. 11, pp- 8145-8155, 2017.
- Sameena Pathan, K. Gopalakrishna Prabhu and P C Siddalingaswamy, A pixel processing approach for retinal vessel extraction using modified Gabor functions, *Progress in Artificial Intelligence*, (doi.org/10.1007/s13748-017-0134-4), 2017
- K. N. Manjunath, K. Gopalakrishna Prabhu, P. C. Siddalingaswamy, “Feasibility of Computed Tomography Colonography as a Diagnostic Procedure in Colon Cancer Screening in India”, *Asian Pacific Journal of Cancer Prevention* , vol. 15, no. 13, pp- 5111-5116, 2014.
- K. N. Manjunath, K. Gopalakrishna Prabhu, P. C. Siddalingaswamy, “Automatic Electronic Cleansing in Computed Tomography Colonography Images using Domain Knowledge”, *Asian Pacific Journal of Cancer Prevention* , vol. 16, no. 18, pp- 8351-8358, 2015.
- K. N. Manjunath, K. Gopalakrishna Prabhu, P. C. Siddalingaswamy, “An Improved Method of Colon Segmentation in Computed Tomography Colonography Images Using Domain Knowledge”, *Journal of Medical Imaging and Health Informatics* , vol. 6, no. 4, pp- 916-924, 2016.
- P. C. Siddalingaswamy K. Gopalakrishna Prabhu and Vikram Jain, “Automatic detection of severity levels in exudative maculopathy”, *Journal of Biomedical Engineering: Applications, Basis and Communications*, vol. 23, no. 3, pp. 173-179, 2011.
- P. C. Siddalingaswamy and K. Gopalakrishna Prabhu, “Automatic detection of multiple oriented blood vessels in retinal images”, *Journal of Biomedical Science and Engineering (JBiSE)*, vol. 3, no. 1, pp. 101-107, 2010.
- P. C. Siddalingaswamy and K. Gopalakrishna Prabhu, “Automatic localization and boundary detection of optic disc using implicit active contours”, *International Journal of Computer Applications (IJCA)*, vol. 1, pp.1-5, 2010.

Conference Proceedings

- Cauvery, K., Siddalingaswamy, P. C., Pathan, S., & D'Souza, N. (2021). A Multiclass Skin Lesion classification approach using Transfer learning based convolutional Neural Network. In Proceedings of 2021 IEEE 7th International Conference on Bio Signals, Images and Instrumentation, ICBSII 2021 [9445175]
- Pathan, S. B., Siddalingaswamy, P. C., & Prabhu, G. (2018). Study of Melanocytic Nevi using image processing. In RTEICT 2017 - 2nd IEEE International Conference on Recent Trends in Electronics, Information and Communication Technology, Proceedings (Vol. 2018-January, pp. 368-372)
- Mishra, A. K., & Siddalingaswamy, P. C. (2017). Analysis of tree based search techniques for solving 8-puzzle problem. In 2017 Innovations in Power and Advanced Computing Technologies, i-PACT 2017 (Vol. 2017-January, pp. 1-5). Institute of Electrical and Electronics Engineers Inc.
- Manjunath, K. N., Siddalingaswamy, P. C., & Prabhu, G. K. (2017). An Improved Method of Polyp Size Measurement in Computed Tomography Colonography Images. In Proceedings of 2017 International Conference on Graphics and Signal Processing, ICGSP 2017 (Vol. Part F130281, pp. 26-29). Association for Computing Machinery (ACM).
- Pathan, S., Lakshmi, L., Siddalingaswamy, P. C., & Gopalakrishna Prabhu, K. (2017). Classification of benign and malignant melanocytic lesions: A CAD tool. In 2017 International Conference on Advances in Computing, Communications and Informatics, ICACCI 2017 (Vol. 2017-January, pp. 1308-1312)
- Madheswaran, G., Ramesh, V., Bhat, S., Ganapathi Nayak, K., Siddalingaswamy, P. C., & Nabeel, A. (2017). Computer based rehabilitation for patients with central vision loss. In 2017 International Conference on Advances in Computing, Communications and Informatics, ICACCI 2017 (Vol. 2017-January, pp. 2069-2072). Institute of Electrical and Electronics Engineers.
- Manjunath, K. N., Prabhu, K. G., & Siddalingaswamy, P. C. (2016). A knowledge based approach for colon segmentation in CT colonography images. In IEEE 2015 International Conference on Signal and Image Processing Applications, ICSIPA 2015 - Proceedings (pp. 65-70). [7412165]
- Manjunath, K. N., Prabhu, K. G., & Siddalingaswamy, P. C. (2016). An expert system for electronic cleansing of contrast in CT colonography images. In IEEE 2015 International Conference on Signal and Image Processing Applications, ICSIPA 2015 - Proceedings (pp. 71-76). [7412166]
- Aithal, P. K., Rajesh, G., Siddalingaswamy, P. C., & Acharya, D. U. (2011). A novel skew estimation approach using radon transform. In Proceedings of the 2011 11th International Conference on Hybrid Intelligent Systems, HIS 2011 (pp. 1-4). [6122070]
- Siddalingaswamy, P. C., & Prabhu, K. G. (2010). Automatic grading of diabetic maculopathy severity levels. In International Conference on Systems in Medicine and Biology, ICSMB 2010 - Proceedings (pp. 331-334).
- Siddalingaswamy, P. C., & Prabhu, K. G. (2009). Automated Detection of Optic Disc and Exudates in Retinal Images. In 13th International Conference on Biomedical Engineering - ICBME 2008 (Vol. 23, pp. 277-279)
- Siddalingaswamy, P. C., & Prabhu, K. G. (2009). Automatic Segmentation of Blood Vessels in Colour Retinal Images using Spatial Gabor Filter and Multiscale Analysis. In 13th International Conference on Biomedical Engineering - ICBME 2008 (Vol. 23, pp. 274-276)
- Siddalingaswamy, P. C., & Prabhu, G. K. (2008). Automated detection of anatomical structures in retinal images. In Proceedings - International Conference on Computational Intelligence and Multimedia Applications, ICCIMA 2007 (Vol. 3, pp. 164-168). [4426361]

Professional Affiliations

IEEE member

Life Member of Biomedical Engineering Society of India (BMESI)