MD MOSTAFA KAMAL SARKER (PhD)

Research Fellow

Centre for Cancer Research and Cell Biology Queen's University Belfast
97 Lisburn Rd, Belfast BT9 7AE, UK.

Web: https://mksarker.github.io/
Email: m.kamal.sarker@gmail.com
Google Scholar: https://scholar.google.ca/citations?hl=en&user=0QoHURIAAAAJ

Research Interests:

My research is in the areas of Deep Learning, Machine Learning, Computer Vision, Image Processing, Pattern Recognition and Artificial Intelligence (AI). Currently, I am applying computer vision and deep learning algorithms to digital pathology (DP) for developing an AI based DP image analysis system.

Education:

2003 - 2008	**B.Sc.,** Physics, Shahjalal University of Science and Technology, Bangladesh.
2011 - 2013	**M.Eng.,** Electronics Engineering, Chonbuk National University, South Korea.
2016 - 2019	**Ph.D. (Cum Laude)**, Computer Engineering, Rovira i Virgili Univerisity, Spain.
	Thesis title: "**Efficient Deep Learning Models and Their Applications to Health Informatics**".
	Thesis Advisor: Professor Domenec Puig, Professor Petia Radeva.

Employment History:

Academic Appointments

01.05.2020-present	Research Fellow, Queen's University Belfast, UK.
01.09.2019-01.31.2019	Research Associates, Fundació Bosch i Gimpera, University of Barcelona, Spain.
01.09.2016-31.08.2019	Pre-doctoral Research Fellow, Department of Computer Engineering and Mathematics Security, Rovira i Virgili Univerisity Tarragona, Spain.
01.09.2013-31.08.2016	Research Fellow, National Research Foundation of Korea, Wonkwang University, South Korea.
01.09.2011-31.08.2013	Research Assistant, Department of Electronics Engineering, Chonbuk National University, South Korea.

Other Employment

01.03.2011-31.08.2013	Lead Researcher in a project "License Plate Recognition Engine", Dics Vision Co., Ltd. Jeonju-city, South Korea.
01.01.2010-31.08.2011	System Engineer (IT and Technical), Radio Furti Ltd., Dhaka, Bangladesh.

Post Graduate Education and Training:

05.07.2017 - 06.07.2017	Summer school on Deep Learning, University of Alicante, Spain.
01.10.2018 – 03.01.2019	Internship, INP-ENSEEIHT, University of Toulouse, France. (**Dr. Sylvie Chambon**)

Honors and Awards:

2011	Brain Korea 21 Fellowship, Chonbuk National University, awarded for Masters studies.
2014	Award of Excellence, Wonkwang University, Korea, awarded for research excellence.
2016	Martí Franquès Research Fellowship, Rovira i Virgili Univerisity, awarded for PhD studies.

Publications:

Peer-reviewed journal articles

1. **Md Mostafa Kamal Sarker,** Hatem A. Rashwan, Farhan Akram, Estefania Talavera, Syeda Furruka Banu, Petia Radeva, and Domenec Puig. "Recognizing Food Places in Egocentric Photo-streams using Multi-scale Atrous Convolutional Networks and Self-Attention Mechanism". IEEE Access, pp. 39069-39082, vol. 7, 2019. (**Q1: Impact factor 2019: 4.09**).

2. Estefania Talavera, Maria Leyva-Vallina, **Md Mostafa Kamal Sarker**, Domenec Puig, Nicolai Petkov and Petia Radeva. "Hierarchical approach to classifying food scenes in egocentric photo-streams". IEEE Journal of Biomedical and Health Informatics. 2019. (**Q1: Impact factor 2019: 4.217**).
3. Singh, Vivek Kumar, Hatem Rashwan, Farhan Akram, Nidhi Pandey, **Md Mostafa Kamal Sarker**, Adel Saleh, Domenec Puig. "Breast Tumor Segmentation and Shape Classification in Mammograms using Generative Adversarial and Convolutional Neural Network". Expert Systems with Applications. pp.112855, July 2019. (**Q1: Impact factor 2019: 4.217**).
4. **Md Mostafa Kamal Sarker** and Moon Kyou Song. "Segmentation and Recognition of Korean Vehicle License Plate Characters Based on the Global Threshold Method and the Cross-Correlation Matching Algorithm". Journal of Information Processing Systems, vol. 12, no. 4, pp. 661~680, 2016. (**Q3: Impact factor 2018: 0.26**).
5. **Md Mostafa Kamal Sarker**, Cai Weihua, and Moon Kyou Song. "Detection and Recognition of Illegally Parked Vehicle based on Adaptive Gaussian Mixture Model and Seed Fill Algorithm". Journal of Info. and Communication Converg. Eng. (JICCE), vol.13, no. 3, pp. 197~204, 2015. (**Q3: Impact factor 2018: 0.24**).
6. Moon Kyou Song and **Md Mostafa Kamal Sarker**. "Modeling and Implementing Two-Stage AdaBoost for Real-Time Vehicle License Plate Detection". Journal of Applied Mathematics, Article ID 697658, 2014. (**Q4: Impact factor 2018: 0.2**).
7. **Md Mostafa Kamal Sarker** and Moon Kyou Song. "Real-Time Vehicle License Plate Detection based on Background Subtraction and Cascade of Boosted Classifier". The Journal of Korea Information and Communications Society (J-KICS), vol.39C, no.10, pp. 909-919, 2014.
8. **Md Mostafa Kamal Sarker**, Sook Yoon, and Dong Sun Park. "A Fast and Robust License Plate Detection Algorithm Based on Two-stage Cascade AdaBoost". KSII Transactions on Internet and Information Systems (TIIS), vol.8, no.10, pp.3490-3507, 2014. (**Q3: Impact factor 2018: 0.19**).
9. **Md Mostafa Kamal Sarker**, Sook Yoon, Jaehwan Lee, and Dong Sun Park, "A Novel License Plate Detection Method Based on Heuristic Energy Map" The Journal of Korea Information and Communications Society (JKICS), vol. 38C, no. 12, pp. 1114-1125, 2013.

Other articles

1. **Md Mostafa Kamal Sarker**, Hatem A. Rashwan, Mohamed Abdel-Nasser, Vivek Kumar Singh, Syeda Furruka Banu, Farhan Akram, Forhad U H Chowdhury, Kabir Ahmed Choudhury, Sylvie Chambon, Petia Radeva, Domenec Puig. "MobileGAN: Skin Lesion Segmentation Using a Lightweight Generative Adversarial Network". arXiv preprint arXiv:1907.00856. 2019.
2. Vivek Kumar Singh, Hatem A. Rashwan, Mohamed Abdel-Nasser, **Md Mostafa Kamal Sarker**, Farhan Akram, Domenec Puig. "An Efficient Solution for Breast Tumor Segmentation and Classification in Ultrasound Images Using Deep Adversarial Learning". arXiv preprint arXiv:1907.00887. 2019
3. Farhan Akram, Vivek Kumar Singh, Hatem A Rashwan, Mohamed Abdel-Nasser, Sarker, **Md Mostafa Kamal Sarker**, Domenec Puig. "Adversarial Learning with Multiscale Features and Kernel Factorization for Retinal Blood Vessel Segmentation". arXiv preprint arXiv:1907.02742. 2019.

Conference proceeding

1. **Md Mostafa Kamal Sarker**, Hatem A. Rashwan, Estefania Talavera, S. Furruka Banu, Petia Radeva, and Domenec Puig. "MACNet: Multi-scale Atrous Convolution Networks for Food Places Classification in Egocentric Photo-Streams". In: European Conference on Computer Vision - ECCV 2018 (EPIC@ECCV WS). Munich, Germany. September 8 -14, 2018.
2. **Md Mostafa Kamal Sarker**, Hatem A. Rashwan, Syeda Furruka Banu, Adel Saleh, Vivek Kumar Singh, Forhad Chowdhury, Domenec Puig. "SLSDeep: Skin Lesion Segmentation Based on Dilated Residual and Pyramid Pooling Networks"}. In: Medical Image Computing and Computer Assisted Intervention – MICCAI 2018. Granada, Spain. September 16-20 2018. (**CORE ranking: A**)
3. Singh, Vivek Kumar, Santiago Romani, Hatem A. Rashwan, Farhan Akram, **Md Mostafa Kamal Sarker**, Domenec Puig. "Conditional Generative Adversarial and Convolutional Networks for X-ray Breast Mass Segmentation and Shape Classification". In: Medical Image Computing and Computer Assisted Intervention – MICCAI 2018. Granada, Spain. September 16-20 2018. (**CORE ranking: A**)
4. **Md Mostafa Kamal Sarker**, Mohammed Jabreel, Hatem A. Rashwan, Syeda Furruka Banu, Petia Radeva, and Domenec Puig. "CuisineNet: Food Attributes Classification using Multi-scale Convolution Network". 21th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2018), Roses, Spain. 8-10th October 2018.

5. Singh, Vivek Kumar, Hatem Rashwan, Farhan Akram, Nidhi Pandey, **Md Mostafa Kamal Sarker**, Adel Saleh, Domenec Puig. "Retinal Optic Disc Segmentation using Conditional Generative Adversarial Network". 21th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2018), Roses, Spain. 8-10th October 2018.
6. Farhan Akram, Miguel Angel Garcia, Vivek Kumar Singh, **Md Mostafa Kamal Sarker** and Domenec Puig. "Brain MR Image Segmentation Using Multiphase Active Contours Based on Local and Global Fitted Images". 21th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2018), Roses, Spain. 8-10th October 2018.
7. Adel Saleh, Mohamed Abdel-Nasser, **Md Mostafa Kamal Sarker**, Vivek Kumar Singh, Saddam Abdulwahab, Nasibeh Saffari, Miguel Angel Garcia, and Domenec Puig. " Deep visual embedding for image classification". In 2018 International Conference on Innovative Trends in Computer Engineering(ITCE), Aswan, Egypt. 19-21 February 2018.
8. **Md Mostafa Kamal Sarker**, Maria Leyva, Adel Saleh, Vivek Kumar Singh, Farhan Akram, Petia Radeva and Domenec Puig. "FoodPlaces: Learning Deep Features for Food Related Scene Understanding". 20th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2017). Deltebre, Spain. 25-27th October 2017.
9. Vivek Kumar Singh, Santiago Romani, Jordina Torrents-Barrena, Farhan Akram, Nidhi Pandey, **Md Mostafa Kamal Sarker**, Adel Saleh, Meritxell Arenas, Miguel Arquez and Domenec Puig. "Classification of Breast Cancer Molecular Subtypes from their Micro-Texture in Mammograms using a VGGNet-Based Convolutional Neural Network". 20th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2017). Deltebre, Spain. 25-27th October 2017.
10. Farhan Akram, Miguel Angel Garcia, Vivek Kumar Singh, **Md Mostafa Kamal Sarker**, and Domenec Puig. "Image segmentation using active contours driven by bias fitted image robust to intensity inhomogeneity". 20th International Conference of the Catalan Association for Artificial Intelligence (CCIA 2017). Deltebre, Spain. 25-27th October 2017.
11. **Md Mostafa Kamal Sarker**, and Moon Kyou Song. "Korean Car License Plate Character Recognition using Local Line Binary Pattern". In Proceedings of the Korea Information Communications Society Winter 2015 Conference, pp. 112-114, Seoul, Korea, Jan. 2015.
12. **Md Mostafa Kamal Sarker**, and Moon Kyou Song. "A novel license plate character segmentation method for different types of vehicle license plates". 2014 International Conference on Information and Communication Technology Convergence (ICTC), pp. 84-88, Busan, Korea, 2014.
13. **Md Mostafa Kamal Sarker**, D. S. Park and L. Badarch. "Electronic control sensors applications for the next generation tractor based on open source library". 2012 Sixth International Conference on Sensing Technology (ICST), pp. 486-491, Kolkata, India, 2012.
14. **Md Mostafa Kamal Sarker**, Dae Seok Jang, Sook Yoon, and Dong Sun Park. "License Plate Detection Based on Haar-like Features and AdaBoost Algorithm". in Proc. of KISM Spring Conference 2013, vol.2, no.1, Sunchon, Korea, Jun. 2013,
15. **Md Mostafa Kamal Sarker**, and Dong Sun Park. "License Plate Character Region Detection Using Contour Algorithm in Night Time Vehicle Image". in Proc. of KISM Fall Conference 2012, vol.1, no.1, Jeonju, Korea, Dec. 2012.
16. **Md Mostafa Kamal Sarker**, Dong Sun Park, Woonchul Ham, Enkhbaatar Tumenjargal and JaeHwan Lee. "Embedded Workbench Application of GPS Sensor for Agricultural Tractor". in Proc. of 2012 WORLDCOMP'12 Conference on Embedded Systems and Applications (ESA 2012), Las Vegas, USA, 2012.

Research Projects:

Current projects

1. *Position*: Research Fellow, *Name*: PathLAKE: Pathology Image Data Lake for Analytics Knowledge & Education. *Supported by*: Centre for Cancer Research and Cell Biology in Queen's University Belfast, UK. *Responsibilities*: Design and develop a deep learning-based pathology image analyst system.

Past projects

1. *Position*: Research Associates, *Name*: IKIWI Industrial Cleaning Robot. *Supported by*: Fundació Bosch i Gimpera, University of Barcelona. *Responsibilities*: Design and develop an industrial cleaning robot.
2. *Position*: Pre-doctoral Researcher. *Name*: Food related scene classification under the paradigm of lifelogging. *Supported by*: Martí Franquès Research Fellowship Programme (PIPF URV-FCLP). *Responsibilities*: Design and develop deep learning algorithms for classifying food and related scenes using egocentric images.

3. *Position*: Lead Researcher. *Name*: Skin Lesion segmentation and classification in dermoscopic images. *Supported by*: Intelligent Robotics and Computer Vision (IRCV) group, Rovira i Virgili Univerisity. *Responsibilities*: Design and develop deep learning algorithms for skin lesion segmentation and classification in dermoscopic images.
4. *Position*: Lead Researcher. *Name*: Identifying illegally parked vehicles by fusing of object detection algorithms. *Supported by*: National research foundation of Korea. *Responsibilities*: Innovate new computer vision algorithms for identifying illegally parked vehicles.
5. *Position:* Lead Researcher. *Name*: Vehicle speed monitoring system on roads. *Supported by*: The Ministry Of Trade, Industry & Energy and Honam Institute For Regional Program. *Responsibilities*: Research and develop techniques and algorithms for object detection towards vehicle speed monitoring system.
6. *Position*: Researcher. *Name*: Development of an electronic control technique for the next generation tractor. *Supported by*: The Brain Korea-21 (BK21). *Responsibilities*: Contribute research that can be applied to electronic control sensor for the next generation tractor.
7. *Position*: Lead Researcher. *Name*: License plate recognition engine. *Supported by*: The Dics Vision Co. Ltd, for industrial collaboration with the multimedia lab at CBNU. *Responsibilities*: Develop robust software for License plate recognition engine system.

Skills and Abilities:

- **Knowledge**: Machine Learning, Deep Learning, Computer vision, Image Processing, Medical Image Analysis, Pattern Recognition, Vehicle tracking, Intelligent Traffic System, Electronic Control Sensor.
- **Knowledge in Deep Learning**: Classification (**VGG**, **ResNet**, **GoogleNet**, etc.), Segmentation (**FCN**, **SegNet**, **UNet**, **DeepLab**, etc.), Object Detection (**FasterRCNN**, **YOLO**, **SSD**, etc.), **RNN**, **LSTM**, **GRU**, **GANs**, etc.
- **Knowledge in programming:** 1. Python both in Windows and Linux, C/C++, Matlab.
  2. CV and ML based Open Source software including OpenCV, Scikit-learn, Scikit-image.
  3. Deep Learning programming libraries: Pytorch, Tensorflow, Keras and Caffe.
  4. Medical imaging modalities: DICOM, NifTI.