Md. Kamrul Hasan

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https://med-ai.netlify.app/
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[**Citations**: 1407, **h-index**: 20, and **i10-index**: 26] [**Scholar Profile Link**]

Education

2022 – Till date — **PhD in Bioenginnering**, Imperial College London (ICL), London, UK.
Thesis title (tentative): *Congenital Heart Malformation Detection from 4D (3D+time) Fetal Echocardiography Using Deep Learning*
Results: Running

2017 – 2019 — **MSc in Medical Imaging and Applications**, University of Burgundy (France), University of Cassino and Southern Lazio (Italy), and University of Girona (Spain).
Thesis title: *Detection, Segmentation, and 3D Pose Estimation of Surgical Tools Using Deep Convolutional Neural Networks and Algebraic Geometry [**Link**].*
[The thesis has been published in **Medical Image Analysis** (Elsevier)].
Results: Marks of **8.48** out of **10.0**

2015 – 2017 — **MSc in Electrical and Electronic Engineering**, Khulna University of Engineering & Technology, Khulna-9203, Bangladesh.
Thesis title: *Effective Electrode Position and Feature Selection for EEG-based Epilepsy Detection.*
Results: CGPA of **4.00** out of **4.00**

2009 – 2014 — **BSc in Electrical and Electronic Engineering**, Khulna University of Engineering & Technology, Khulna-9203, Bangladesh.
Thesis title: *A Direct Non-invasive Brain Interface with Computer Based on Steady-state Visual-evoked Potential with High Transfer Rates.*
Results: CGPA of **3.93** out of **4.00** [*Secured **first** position in the class out of **115** students*]

Skills

Languages — Strong reading, writing, listening, and speaking skills in English and native Bangla.
Coding — Python with image and signal processing libraries, MATLAB, C/C^{++}, R, and Java.
Frameworks — DL APIs (Keras, Tensorflow, Pytorch), DL4J API, OpenCV, VLFeat, Nibabel, Pydicom, Elastix, ITK-SNAP, MITK, MeshLab, ImageJ, Jupyter Notebook, and KUKA Control Toolbox.
Image modalities — MRI (2D/3D), CT (2D/3D/4D), Ultrasound (2D/3D/4D), Mammography, X-ray, Dermoscopic, Laparoscopic, Fundus, and Natural Images.
Miscellaneous — Latex, MS Power-BI/word/window/kinect, Linux, academic research, teaching, training, team-work & collaboration, and student supervision.

Employment History

2024 – Present — **Graduate Teaching Assistant.** Department of Bioenginnering, Imperial College London, UK.
2022 – Present — **Research Postgraduate.** Department of Bioenginnering, Imperial College London, UK.
2015 – Present — **Teaching Staff (On Leave).** Department of Electrical and Electronic Engineering, Khulna University of Engineering & Technology, Khulna-9203, Bangladesh.
2018 – 2019 — **Research Intern.** EnCoV research team, Clermont-Ferrand, France.

Awards and Achievements

2022 — **EPSRC-DTP SCHOLARSHIP**, The Department of Bioengineering, Imperial College London, provides this award for covering the total tuition fees and a stipend of a Ph.D. student.

Awards and Achievements (continued)

2018 **UNIVERSITY GOLD MEDAL** from the Chancellor of KUET, the President of Bangladesh, for achieving a minimum CGPA of 3.75 (out of 4.0) and ranking first in class.

2017 **ERASMUS MUNDUS SCHOLARSHIP**, The Erasmus Mundus Program supports European top-quality Master Courses and enhances the visibility and attractiveness of European higher education.

2014 **DEANS AWARDS (4-times)**, Deans Awards for securing a minimum CGPA of 3.75 or above (out of 4.0) in each academic year.

HONORS, Honors are provided to the graduates having a minimum CGPA of 3.75 or above (out of 4.0).

TECHNICAL SCHOLARSHIP (4-times), This scholarship is offered to the students based on their merit position in the class at KUET.

Selected Research Publications

1. Hasan, M. K., Ahamad, M. A., Yap, C. H., & Yang, G. (2023). A survey, review, and future trends of skin lesion segmentation and classification. *Computers in Biology and Medicine*, 106624.
2. Hasan, M. K., Zhu, H., Yang, G., & Yap, C. H. (2023). Multi-scale, data-driven and anatomically constrained deep learning image registration for adult and fetal echocardiography. *arXiv e-prints*, arXiv–2309.
3. Rahman, M., Hasan, M. K., Madhurja, M. M., & Ahmad, M. (2023). Ensemble of boosting algorithms for parkinson disease diagnosis. *Proceedings of International Conference on Information and Communication Technology for Development: ICICTD 2022*, 343–354.
4. Hasan, M. K., Alam, M. A., Dahal, L., Roy, S., Wahid, S. R., Elahi, M. T. E., Martı, R., & Khanal, B. (2022). Challenges of deep learning methods for covid-19 detection using public datasets. *Informatics in Medicine Unlocked*, 100945.
5. Hasan, M. K., Elahi, M. T. E., Alam, M. A., Jawad, M. T., & Martı, R. (2022). DermoExpert: Skin lesion classification using a hybrid convolutional neural network through segmentation, transfer learning, and augmentation. *Informatics in Medicine Unlocked*, 100819.
6. Hasan, M. K., & Jawad, M. T. (2022). Breast cancer classification using ensemble of machine learning boosting algorithms. *2022 International Conference on Inventive Computation Technologies (ICICT)*, 444–451.
7. Hasan, M. K., Wahid, S. R., Rahman, F., Maliha, S. K., & Rahman, S. B. (2022). Grasp-and-lift detection from eeg signal using convolutional neural network. *2022 International Conference on Advancement in Electrical and Electronic Engineering (ICAEEE)*, 1–6.
8. Raihan, M., Hassan, M., Hasan, T., Bulbul, A. A.-M., Hasan, M. K., Hossain, M., Roy, D. S., Awal, M. et al. (2022). Development of a smartphone-based expert system for covid-19 risk prediction at early stage. *Bioengineering*, *9*(7), 281.
9. Sen, O., Fuad, M., Islam, M. N., Rabbi, J., Masud, M., Hasan, M. K., Awal, M. A., Fime, A. A., Fuad, M. T. H., Sikder, D. et al. (2022). Bangla natural language processing: A comprehensive analysis of classical, machine learning, and deep learning-based methods. *IEEE Access*, *10*, 38999–39044.
10. Dutta, A., Hasan, K., Ahmad, M. et al. (2021). Skin lesion classification using convolutional neural network for melanoma recognition. *Proceedings of International Joint Conference on Advances in Computational Intelligence*, 55–66.
11. Ghosh, T. K., Hasan, M. K., Roy, S., Alam, M. A., Hossain, E., & Ahmad, M. (2021). Multi-class probabilistic atlas-based whole heart segmentation method in cardiac ct and mri. *IEEE Access*, *9*, 66948–66964.
12. Hasan, M. K., Alam, M. A., Elahi, M. T. E., Roy, S., & Martı, R. (2021). DRNet: Segmentation and localization of optic disc and fovea from diabetic retinopathy image. *Artificial Intelligence in Medicine*, *111*, 102001.
13. Hasan, M. K., Alam, M. A., Roy, S., Dutta, A., Jawad, M. T., & Das, S. (2021). Missing value imputation affects the performance of machine learning: A review and analysis of the literature (2010–2021). *Informatics in Medicine Unlocked*, *27*, 100799.
14. Hasan, M. K., Calvet, L., Rabbani, N., & Bartoli, A. (2021). Detection, segmentation, and 3d pose estimation of surgical tools using convolutional neural networks and algebraic geometry. *Medical Image Analysis*, *70*, 101994.

15 Hasan, M. K., Jawad, M. T., Dutta, A., Awal, M. A., Islam, M. A., Masud, M., & Al-Amri, J. F. (2021). Associating measles vaccine uptake classification and its underlying factors using an ensemble of machine learning models. *IEEE Access*, *9*, 119613–119628.

16 Hasan, M. K., Jawad, M. T., Hasan, K. N. I., Partha, S. B., Al Masba, M. M., Saha, S., & Moni, M. A. (2021). Covid-19 identification from volumetric chest ct scans using a progressively resized 3d-cnn incorporating segmentation, augmentation, and class-rebalancing. *Informatics in Medicine Unlocked*, *26*, 100709.

17 Hasan, M. K., Roy, S., Mondal, C., Alam, M. A., Elahi, M. T. E., Dutta, A., Raju, S. T. U., Jawad, M. T., & Ahmad, M. (2021). Dermo-DOCTOR: A framework for concurrent skin lesion detection and recognition using a deep convolutional neural network with end-to-end dual encoders. *Biomedical Signal Processing and Control*, *68*, 102661.

18 Islam, M. R., Moni, M. A., Islam, M. M., Rashed-Al-Mahfuz, M., Islam, M. S., Hasan, M. K., Hossain, M. S., Ahmad, M., Uddin, S., Azad, A. et al. (2021). Emotion recognition from eeg signal focusing on deep learning and shallow learning techniques. *IEEE Access*, *9*, 94601–94624.

19 Mondal, C., Hasan, M. K., Ahmad, M., Awal, M. A., Jawad, M. T., Dutta, A., Islam, M. R., & Moni, M. A. (2021). Ensemble of convolutional neural networks to diagnose acute lymphoblastic leukemia from microscopic images. *Informatics in Medicine Unlocked*, *27*, 100794.

20 Hasan, M. K., Alam, M. A., Das, D., Hossain, E., & Hasan, M. (2020). Diabetes prediction using ensembling of different machine learning classifiers. *IEEE Access*, *8*, 76516–76531.

21 Hasan, M. K., Aleef, T. A., & Roy, S. (2020). Automatic mass classification in breast using transfer learning of deep convolutional neural network and support vector machine. *2020 IEEE Region 10 Symposium (TENSYMP)*, 110–113.

22 Hasan, M. K., Dahal, L., Samarakoon, P. N., Tushar, F. I., & Martı, R. (2020). DSNet: Automatic dermoscopic skin lesion segmentation. *Computers in Biology and Medicine*, *120*, 103738.

23 Tushar, F. I., Alyafi, B., Hasan, M. K., & Dahal, L. (2019). Brain tissue segmentation using NeuroNet with different pre-processing techniques. *2019 Joint 8th International Conference on Informatics, Electronics & Vision (ICIEV) and 2019 3rd International Conference on Imaging, Vision & Pattern Recognition (icIVPR)*, 223–227.

24 Hasan, M., Ahamed, M., Ahmad, M., Rashid, M. et al. (2017). Prediction of epileptic seizure by analysing time series eeg signal using k-nn classifier. *Applied bionics and biomechanics*, *2017*.

25 Hasan, M. K., Rusho, R. Z., Hossain, T. M., Ghosh, T. K., & Ahmad, M. (2014). Design and simulation of cost effective wireless eeg acquisition system for patient monitoring. *2014 International Conference on Informatics, Electronics & Vision (ICIEV)*, 1–5.

Selected Project Implementations

- "Non-rigid 3D lung CT (4DCT) registration"; ***Supervisor:*** Dr. Robert Marti and Dr. Rafael Garcia Campos, UdG, Spain; ***Materials:*** MATLAB, Elastix, and ITK-SNAP.
- "Brain Tissue (CSF, GM, and WM) segmentation using expectation-maximization and Gaussian mixture model"; ***Supervisor:*** Dr. Robert Marti and Dr. Xavier Llado, UdG, Spain; ***Materials:*** MATLAB.
- "Atlas+Expectation-maximization-based brain tissue (CSF, GM, and WM) segmentation"; ***Supervisor:*** Dr. Robert Marti and Dr. Xavier Llado, UdG, Spain; ***Materials:*** MATLAB and Elastix.
- "Automatic hand segmentation using active shape model"; ***Supervisor:*** Dr. Arnau Oliver and Dr. Xavier Llado, UdG, Spain; ***Materials:*** Python, MATLAB, OpenCV, Sklearn, *etc.*
- "Brain tissue segmentation using transfer learning of deep CNN (NeuroNet)"; ***Supervisor:*** Dr. Robert Marti and Dr. Xavier Llado, UdG, Spain; ***Materials:*** Python, OpenCV, Keras API, Sklearn, *etc.*
- "Inverse kinematic controller to emulate a screwing movement of a KUKA manipulator (6-DOF)"; ***Supervisor:*** Prof. Dr. Gianluca Antonelli, UNICAS, Cassino, Italy; ***Materials:*** MATLAB and KUKA Control Toolbox.
- "3D scanner implementation using C^{++} and kinect-v2"; ***Supervisor:*** Prof. Dr. Y. Fougerolle, University of Burgundy (UB), France; ***Materials:*** C^{++}, OpenCV, SURF, SIFT, *etc.*

References

Available on Request