Ihsan Ullah

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🌐 https://ihsan149.github.io

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Research Statement

Most deep learning-based methods require a considerable amount of labeled data, which is difficult to come by in the computer vision and medical field. I am interested in developing a unsupervised domain adaptation methods to learn from synthetic data to mitigate the labeling efforts.
Keywords: Deep learning, Unsupervised Domain Adaptation, Segmentation, Classification, Detection.

Employment History

2018-03 – 2023-02	🔖	**PhD Research Student,** MISPL, Robotics and Mechatronics Engineering, DGIST.
2017-09 – 2018-02	🔖	**Post MS Researcher,** MISPL, Robotics and Mechatronics Engineering, DGIST.
2015 – 2017-08	🔖	**MS Research Student,** Software Engineering Lab, Chonbuk National University .

Education

2018 – 2023	🔖	**Ph.D. Robotics and Mechatronics Engineering** Daegu Gyeongbuk Institute of Science and Technology. Thesis title: *Catheter Localization and Tracking using Convolutional Neural Networks with Generative Modeling.*
2015 – 2017	🔖	**M.S. Computer Science and Engineering,** Chonbuk National University. Thesis title: *Vehicles Information Extraction Based on Deep Neural Network.*
2010 – 2014	🔖	**B.S. Computer Science,** Abdul Wali Khan University Mardan. Thesis title: *Developed Dynamic Website (Crime File Management System).*

Research Publications

Articles in Submission/Preparation

1. **Ullah, I.,** An, S., Myeong Kyun, K., & Park, S. H. (In Review). Video domain adaptation for semantic segmentation using perceptual consistency matching. In *Computer vision and pattern recognition.* CVPR23.

2. **Ullah, I.,** Baber, S., Ali, F., EI-Sappagh, S., Abuhmed, T., & Park, S. H. (Fourth round revision). A deep learning based dual encoder-decoder framework for anatomical structure segmentation in chest fluoroscopic images. In *Scientific reports.* Elsevier.

Journal Articles

1. Farman, A., Muhammad, S., Tariq, H. S. B., **Ullah, I.,** Sayyed Mudassar, S., & Park, S. H. (Accepted). Deep learning-based segmentation and classification of leaf images for detection of tomato plant disease. *Frontiers in Plant Science.* Retrieved from
🔗 https://www.frontiersin.org/articles/10.3389/fpls.2022.1031748/abstract

2. Jeong, J., Hong, S. T., **Ullah, I.,** Kim, E. S., & Park, S. H. (2022). Classification of the confocal microscopy images of colorectal tumor and inflammatory colitis mucosa tissue using deep learning. *Diagnostics,* 12(2), 288. 🔗 doi:10.3390/diagnostics12020288

3   **Ullah**, **I.**, Chikontwe, P., Choi, H., Yoon, C.-H., & Park, S. H. (2021). Synthesize and segment: Towards improved catheter segmentation via adversarial augmentation. *Applied Sciences*, *11*(4), 1638. 🔗 doi:10.3390/app11041638

4   Allan, M., Kondo, S., **Ullah**, **I.**, Bodenstedt, S., Leger, S., Kadkhodamohammadi, R., … Pedersen, M. et al. (2020). 2018 robotic scene segmentation challenge. *arXiv preprint arXiv:2001.11190*. Retrieved from 🔗 https://arxiv.org/abs/2001.11190v3

5   Lee, H. J., **Ullah**, **I.**, Wan, W., Gao, Y., & Fang, Z. (2019). Real-time vehicle make and model recognition with the residual squeezenet architecture. *Sensors*, *19*(5), 982. 🔗 doi:10.3390/s19050982

6   **Ullah**, **I.**, Chikontwe, P., & Park, S. H. (2019c). Real-time tracking of guidewire robot tips using deep convolutional neural networks on successive localized frames. *IEEE Access*, *7*, 159743–159753. 🔗 doi:10.1109/ACCESS.2019.2950263

Conference Proceedings

1   Chikontwe, P., **Ullah**, **I.**, Kim, J., Won, D., & Park, S. H. (2019). Recurrent attention models for tissue histopathology image classification. Retrieved from 🔗 http://ipiu.or.kr/2019/oral.html

2   **Ullah**, **I.**, Chikontwe, P., & Park, S. H. (2019a). Catheter synthesis in x-ray fluoroscopy with generative adversarial networks. In *"MICCAI PRIME", workshop* (pp. 125–133). Springer. Retrieved from 🔗 https://link.springer.com/chapter/10.1007/978-3-030-32281-6_13

3   **Ullah**, **I.**, Chikontwe, P., & Park, S. H. (2019b). Guidewire tip tracking using u-net with shape and motion constraints. In *2019 international conference on artificial intelligence in information and communication (ICAIIC)* (pp. 215–217). 🔗 doi:10.1109/ICAIIC.2019.8669088

4   Alam, M. N., **Ullah**, **I.**, & Al-Absi, A. A. (2018). Deep learning-based apple defect detection with residual squeezenet. In *International conference on smart computing and cyber security: Strategic foresight, security challenges and innovation* (pp. 127–134). Springer. Retrieved from 🔗 https://link.springer.com/chapter/10.1007/978-981-15-7990-5_12

5   **Ullah**, **I.**, & Lee, H. J. (2017). Moving vehicle detection and information extraction based on deep neural network. In *Proceedings of the international conference on image processing, computer vision, and pattern recognition (IPCV)* (pp. 102–107). The Steering Committee of The World Congress in Computer Science, Computer … Retrieved from 🔗 https://csce.ucmss.com/books/LFS/CSREA2017/IPC6015.pdf

6   **Ullah**, **I.**, & Lee, H. J. (2016a). An approach of locating korean vehicle license plate based on mathematical morphology and geometrical features. In *2016 international conference on computational science and computational intelligence (csci)* (pp. 836–840). IEEE. Retrieved from 🔗 https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=7881455

7   **Ullah**, **I.**, & Lee, H. J. (2016b). An effective algorithm for shadow removal from moving vehicles. In *International symposium on information technology convergence (ISITC 2016), shanghai china.* Retrieved from 🔗 https://www.researchgate.net/publication/317184010_An_Effective_Algorithm_for_Shadow_Removal_from_Moving_Vehicles_Based_on_Morphology

8   **Ullah**, **I.**, & Lee, H. J. (2016c). License plate detection based on rectangular features and multilevel thresholding. In *Proceedings of the international conference on image processing, computer vision, and pattern recognition (IPCV)* (p. 153). The Steering Committee of The World Congress in Computer Science, Computer … Retrieved from 🔗 http://worldcomp-proceedings.com/proc/p2016/IPC4045.pdf

9   **Ullah**, **I.**, & Lee, H. J. (2016d). Moving object detection based on background subtraction. In *Conference of KIISE, june 29-july 01, 2016, jeju, south korea*. Retrieved from 🔗 https://www.dbpia.co.kr/pdf/pdfView.do?nodeId=NODE07017673

Patents

1. Tracking of catheter tip using convolutional neural network
   Title in Korean: 합성곱신경망을 이용한 카테터 끝단 추적기법
   Inventors: **Ihsan Ullah**, DongKyu Won, Sang Hyun Park
   Patent Number: 10-2174246
   Application Number: 10-2018-0054790
   Registration Date: 29/10/2020
   Patent Link
2.Catheter Synthesis in X-Rays(Under-review)
   Title in Korean: X-ray 카테터 시술 영상합성 기법
   Inventors: **Ihsan Ullah**, Philip Chikontwe, Sang Hyun Park
   Patent Number: 10-2174246
   Filing Date: 2019-11-08
   Application Number: P-2019-0256-KR-00

Projects Participation

2018 – 2022	*Surgical robots segmentation and tracking in X-ray sequences based on deep learning.*
	Development of an augmented reality surgery system based on artificial intelligence for surgery.
	Commercialization of immersive robot with multi-sensor technology.
	Development and commercialization of micro/nano robot system for precise treatment of brain diseases and tumors.
2015 – 2017	*Vehicles Information Extraction Based on Deep Neural Network.*
	Face Recognition System Based on Deep Learning in Embedded System (Jetson TX1).
	Deep Learning Based License Plate Detection.

Skills

Languages	Strong reading, writing and speaking competencies for English. IELTS score 6/9 and TOEIC (710/990).
Coding	Python, C++.
Deep Learning Libraries	Tensorflow, Keras, PyTorch, Caffe.
Image Processing Libraries	OpenCV, DLib C++.
Web Dev	Html, css, Apache Web Server.
Misc.	Academic research, teaching, training, consultation, LaTeX typesetting and publishing.

Miscellaneous Experience

Presentations at Conferences, Symposia , Workshops, Seminar and Webinars

2022	Presented a webinar on Catheter and Guidewire Segmentation via Adversarial Learning. in Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology, Pakistan.
2019	Poster presentation in IPIU Conference, Jeju, South Korea.
2018	Poster presentation in Conference of KIISE,Jeju, South Korea.
2017	Oral presentation in Information and Control Symposium, ICS'2017, Jeonju, South Korea.
2016	Oral presentation in Conference of KISM and SEBS,April29-30, 2016, Busan, South Korea.

Awards and Achievements

2018-2022	**Scholarship Award**, DGIST Fully Funded Scholarship for PhD.

Miscellaneous Experience (continued)

2015-2017   🔖 **Scholarship Award**, Chonbuk National University, Fully Funded Scholarship for M.S.

🔖 **Scholarship Award**, Chonbuk National University, Monthly Stipend from Brain Korea 21 Plus (BK-21 Plus).

Summer Schools

2019   🔖 **DGIST Summer School for Machine learning**. Awarded by DGIST.

2018   🔖 **DGIST Summer School for Medical Robot**. Awarded by DGIST.

Institutional and Professional Activities

🔖 Co-founder and member of DISA in DGIST.

🔖 Regional Coordinator Pakistani Student Association (PSAK) Korea in DGIST.

🔖 Active member of Pakistani Student Association (PSAK).

References

Prof. Sang Hyun Park, Ph.D
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