MUHAMMAD AMMAR UL HASSAN

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Location: Gwanak-gu, Bongcheon-dong, Seoul, South Korea
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GitHub: https://github.com/ammar-deep
Personal Website: https://ammar-deep.github.io
Portfolio: Link

PROFESSIONAL PROFILE

Graduate research assistant with 4 years of active research & development experience, including paper publications in Top-tier journals and conferences. Research experience in Deep Learning, Computer Vision, Classification, Object detection, Generative modeling, Generative Adversarial Networks, Image-to-Image translation (Domain transfer), Metric learning, Contrastive learning, Self-supervised learning, Few-shot image generation, Deep learning frameworks, and 2 years of professional experience in Web application development.

EDUCATION

PhD Soongsil University, Computer Science & Engineering — Expected in Feb 2023
Dissertation: "Unsupervised Image Generation for Multiple Domains based on Mixing Regularization and Projection Encoder"
Advisor: Prof. Jaeyoung Choi

MS Soongsil University, Computer Science & Engineering — Aug 2018
Thesis: "FreeType Outlet Adapter (FOA): A module for adding new functionality inside the FreeType rasterizer."
Advisor: Prof. Jaeyoung Choi

BS International Islamic University, Software Engineering — Aug 2013
Final Project: Tic Tac Toe game in android using SMS

SKILLS

Computer Vision: Generative modeling, Classification, Object detection, GANs, Supervised / Unsupervised image-to-image (I2I) translation, Multi-Domain-Multi-Modal-Few-shot image generation, Style transfer, Metric Learning, Contrastive learning, Siamese networks
Programming Languages: PHP, Python, C (knowledgeable), C++ (knowledgeable)
Deep Learning Frameworks: PyTorch, TensorFlow
Databases: MySQL
Web Dev: HTML, CSS, jQuery, Bootstrap, CodeIgniter, WordPress, OpenCart
Misc.: Academic research, teaching, training, LATEX typesetting, and publishing

WORK EXPERIENCE

Graduate Research Assistant 2016 – present

System Software Lab, Soongsil University, Seoul, South Korea

My Ph.D. research focuses on computer vision, with applications in text image synthesis and manipulation, unsupervised image generation, image-to-image translation, and self-supervised learning. Below are a few of the primary research projects on which I've worked.

1. **Controllable Unsupervised Generative Model**
   - Designed a controllable unsupervised generative adversarial network architecture
   - Disentangled the content and style in an unsupervised fashion
   - Applications in image style transfer, attribute manipulation, domain transfer, etc. without label supervision
2. **Few-shot Font Generation**
   - Developed Metric learning and Contrastive learning-based network architectures
     - Learning font style latent space for few-shot font generation
   - Component-guided Korean and Chinese font generation algorithms
   - Applications in text image editing, font library creation, cross-lingual font generation
3. **Font Family Generation**
   - Font family data collection, preprocessing, and labeling
   - Developed a generative model for real-time font family generation
   - Applications in Variable font for typeface variations
4. **Text Image Skeletonization**
   - Character image skeletonization using an end-to-end generative adversarial network (GAN)
   - Developed Skeleton-driven Korean font synthesis model
   - Applications in object representation, manipulation, tracking, recognition
5. **MetaFont Module for FreeType rasterizer**
   - Rasterized MetaFont in Linux operating system
   - Integrated driver module of MetaFont in FreeType rasterizer

Web Developer 2014 – 2016

Tangent Technologies Pvt Ltd, Islamabad, Pakistan

- Developed, designed, and managed web applications
- Built and deployed plugins and extensions for WordPress and OpenCart
  - DHL and Endicia Postage label printing extensions for OpenCart
- Collaborated closely with other team members to efficiently plan, design, and develop robust solutions

TEACHING & PRESENTATION EXPERIENCE

AI for Content Creation Workshop at CVPR Jun 2022
Presented FontNet paper at AI4CC

- Presented my recent work on learning font style in embedding space
- Introduced Triplet loss for learning style space and training style encoder seperately

Soongsil University March 2021 to Jun 2021
Head TA for Deep learning programming (5041345801)

- Taught Applications of Deep Neural Networks by Jeff Heaton
- Python programming language to implement deep learning using TensorFlow 2.0

Korean Society of Computational Science and Engineering Dec 2020
Invited Lecturer for Machine Learning Winter School (KSCSE)

- Tutorial on Generative Adversarial Networks (GANs)
- TensorFlow 2.0
- Tutorial details on Website

The 9th International Conference on Smart Media and Applications Sep 2020
Presented Font2Fonts paper at SMA

- Modified image-to-image translation framework for font generation
- Received best paper bronze award

AMGCC Workshop Aug 2020
Talk on Font Generation trends using Machine Learning

- Discussed various state-of-the-arts font generation methods
- Presented our work on font generation and future directions

PUBLICATIONS

My Google Scholar profile contains a comprehensive listing of my publications.

Hassan, A. U., Memon, I., and Choi, J., "Real-time high quality font generation with conditional font gan," Expert Systems with Applications, 213, 118907. https://doi.org/10.1016/j.eswa.2022.118907. (2022)

Hassan, A. U., and Choi, J., "Fontnet: Closing the gap to font designer performance in font synthesis," AI for Content Creation (AI4CC), CVPR, 2022.

Hassan, A. U., Ahmed, H., and Choi, J., "Unpaired font family synthesis using conditional generative adversarial networks," Knowledge-Based Systems, 229, 107304. https://doi.org/10.1016/j.knosys.2021.107304. (2021)

Hassan, A. U., Lee, H., and Choi, J., "Exploiting Mixing Regularization for Truly Unsupervised Font Synthesis," Under review, Pattern Recognition Letters.

Ko, D. H., **Hassan, A. U**., Suk, J., and Choi, J., "SKFont: Skeleton-driven Korean font generator with conditional deep adversarial networks," International Journal on Document Analysis and Recognition (IJDAR), 1–13. https://doi.org/10.1007/s10032-021-00374-4

Ko, D. H., **Hassan, A. U**., Majeed, S., and Choi, J., "Skelgan: A font image skeletonization method. Journal of Information Processing Systems," Journal of Information Processing Systems, 17(1), 1–13.

PATENTS

Hassan, A. U., and Choi, J., "METHOD AND APPARATUS FOR GENERATING FONT FAMILY USING DEEP LEARNNING,", Soongsil University Industry-Academic Cooperation Foundation, Patent, No. 2-2006-027849-9 (Korea), 2022.

HONORS AND AWARDS

International Graduate Research Scholarship 2018 – present
Soongsil University

Best Paper Bronze award 2020
International Conference on Smart Media and Applications
(SMA)

International Graduate Research Scholarship 2016 – 2018
Soongsil University

Federal Government Scholarship 2009 – 2013
Given to undergraduates whose GPA is high-ranking in his/her own major University

LANGUAGES

English: Proficient
Korean: Learner
Urdu / Hindi: Native Language

REFERENCES

Available on Request