Ankan Kumar Bhunia

https://ankanbhunia.github.io

Research Interests

Computer Vision, Deep Learning, Machine Learning, Generative Modelling, Few-shot Learning, Sketch Generation, Document Image Analysis.

Education

University of Edinburgh, UK 2023 - Present
- PhD in the School of Informatics (Visual Computing Group)
- Supervisor: Dr. Hakan Bilen

Jadavpur University, Kolkata, India 2016 - 2020
- B.E Electrical Engineering (CGPA 8.6/10)

Experience

MBZUAI, Abu Dhabi, UAE November, 2020 - April, 2023
- *Research Assistant at Computer Vision Lab*
- *Advisor*: Dr. Fahad Shahbaz Khan, Dr. Salman Khan
- *Research Direction*: Generative models, Document analysis, Handwriting generation
- *Collaborated with*: Dr. Mubarak Shah, University of Central Florida, USA

University of Manitoba, Canada May, 2019 - August, 2019
- *Research Intern under Mitacs Globalink Internship program*
- *Title*: "Flexible deep learning models in computer vision"
- *Advisor*: Dr. Yang Wang, Associate Professor
- *Description*: I worked on one-shot scene-specific crowd counting that adapts to specific scene.

Robert Bosch, Bangalore, India May, 2018 - July, 2018
- *Research Intern at Computer Vision Lab, RTC Department*
- *Title*: "Synthetic to Photo-realistic Image Generation"
- *Advisor*: Dr. Amit Arvind Kale, Principal Senior Expert
- *Description*: I worked on various domain adaptation techniques and methods.

Indian Institute of Technology (IIT) Roorkee, India. May, 2017 - june, 2020
- *Advisor*: Dr. Partha Pratim Roy
- *Research Direction*: Machine learning, computer vision, pattern recognition, document analysis
- *Collaborated with*: Dr. Umapada Pal, CVPR Unit, ISI-Kolkata, Dr. Alireza Alaei, Research Fellow, Griffith University, Australia.

Selected Research

1. **Ankan Kumar Bhunia**, Changjian Li, Hakan Bilen, *"Looking 3D: Anomaly Detection with 2D-3D Alignment"*, **CVPR**, *2024* **[coming soon]**

2. Amandeep Kumar, **Ankan Kumar Bhunia**, Sanath Narayan, Hisham Cholakkal, Rao Anwer, Jorma Laaksonen, Salman Khan, Ming-Hsuan Yang, Fahad Shahbaz Khan, *"Generative Multiplane Neural Radi-ance for 3D-Aware Image Generation"*, **ICCV**, *2023* **[pdf]**

3. Amandeep Kumar, **Ankan Kumar Bhunia**, Sanath Narayan, Hisham Cholakkal, Rao Anwer, Jorma Laaksonen, Fahad Shahbaz Khan, *"Cross-modulated Few-shot Image Generation for Colorectal Tissue Classification"*, **MICCAI**, *2023* **[pdf]**

4. **Ankan Kumar Bhunia**, Salman Khan, Hisham Cholakkal, Rao Muhammad Anwer, Jorma Laaksonen, Mubarak Shah, Fahad Shahbaz Khan, *"Person Image Synthesis via Denoising Diffusion Model"*, **CVPR**, *2023* **[pdf]** **[webpage]**

5. **Ankan Kumar Bhunia**, Salman Khan, Hisham Cholakkal, Rao Muhammad Anwer, Fahad Shahbaz Khan, Jorma Laaksonen, Michael Felsberg, *"DoodleFormer: Creative Sketch Drawing with Transformers"*, **ECCV**, *2022* **[pdf]** **[webpage]**

6. **Ankan Kumar Bhunia**, Salman Khan, Hisham Cholakkal, Rao Muhammad Anwer, Fahad Shahbaz Khan, Mubarak Shah, *"Handwriting Transformers"*, **ICCV**, *2021* [pdf] [webpage]

7. Ayan Bhunia, Abhirup Das, **Ankan Kumar Bhunia**, Sairaj Kishore, Partha Roy, *"Handwriting Recognition in Low-resource Scripts using Adversarial Learning"*, **CVPR**, *2019* [pdf]

8. **Ankan Kumar Bhunia**, Ayan Bhunia, Aneeshan Sain, Partha Roy, "Improving Document Binarization via Adversarial Noise-Texture Augmentation", **ICIP**, *2019* [pdf]

9. Ayan Bhunia, **Ankan Kumar Bhunia**, Shuvozit Ghose, Partha Roy, Umapada Pal, *"A Deep One-Shot Network for Query-based Logo Retrieval"*, **Pattern Recognition** *(I.F.-8.518)* [pdf]

10. **Ankan Kumar Bhunia***, Aishik Konwer*, Abir Bhowmik, Ayan Bhunia, Partha Roy, *"Script identification in natural scene image and video frames using an attention based Convo-lutional-LSTM network"*, **Pattern Recognition** *(I.F.-8.518)* [pdf]

11. **Ankan Kumar Bhunia**, Ayan Bhunia, Prithaj Banerjee, Aishik Konwer, Abir Bhowmik, Partha Roy, Umapada Pal, *"Word Level Font-to-Font Image Translation using Convo- lutional Recurrent Generative Adversarial Networks"*, **ICPR**, *2018* [pdf]

12. Ayan Bhunia, Subham Mukherjee, Aneeshan Sain, Abir Bhowmik, **Ankan Kumar Bhunia**, Partha Roy, Umapada Pal, *"Indic Handwritten Script Identification Using Offline-Online Multi-modal Deep Network"*, **Information Fusion** *(I.F.-17.564)* [pdf]

13. **Ankan Kumar Bhunia**, Alireza Alaei, Partha Roy, *"Signature Verification Approach using Fusion of Hybrid Texture Features"*, **Neural Computing and Application** *(I.F.-5.606)* [pdf]

14. Aishik Konwer, Ayan Bhunia, **Ankan Kumar Bhunia**, Prithaj Banerjee, Partha Roy, Umapada Pal, *"Staff line Removal using Generative Adversarial Networks"*, **ICPR**, *2018* [pdf]

15. Ayan Bhunia, Abir Bhowmick, **Ankan Kumar Bhunia**, Aishik Konwer, Partha Pratim Roy, Umapada Pal, *"Handwriting Trajectory Recovery using End-to-End Deep Encoder-Decoder Network"*, **ICPR**, *2018* [pdf]

Selected Patents

1. **Ankan Kumar Bhunia**, Salman Khan, Hisham Cholakkal, Rao Anwer, Fahad Shahbaz Khan, *"System and Method for Handwriting Generation"*, *2023,* ID: **US11756244B1**

Research Areas

(1) Generative Modelling: GANs, Denoising Diffusion models, VAE, Autoregressive models.
(2) Applications of Image Generation: Creative AI-art generation, Few-shot generation, Sparse image data generation, Text-to-Image generation, Conditional GANs.
(3) 3D vision applications: 3D generative modelling, 3D reconstruction problems.
(4) Semi-supervised & Unsupervised Models: Few-shot image detection, Domain adaptation.
(5) Document Image Analysis: Vision tasks for sparse image data like sketch/handwriting.

Technical Skills

Programming Languages: Python, C, MATLAB, HTML/CSS
Deep Learning Framework: PyTorch, Tensorflow, Keras
Developer Tools: Git, Docker, Google Cloud Platform, VS Code, PyCharm
Miscellaneous: OpenCV, OpenAI gym, Numpy, Matplolib, Pandas, Scikit-Learn.

Notable Details

(1) I have over **500** *citations* on *Google Scholar* with *h-index* **12**.
(2) I have published in A* computer vision conferences (i.e. **CVPR**, **ICCV**, **ECCV**).
(3) I have served as a reviewer for **TPAMI**, **ICCV ECCV**, **CVPR**, **WACV**.

Links

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