Mohammad Imrul Jubair

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CURRENT POSITION

Graduate Research Assistant

Center for the Brain, A.I., and Child (BAIC)

Computer Science, University of Colorado Boulder, USA Aug 2022 – Present

Current Project: I am currently working on automatic segmentation of 3D Cine Cardiovascular Magnetic Resonance (CMR) image of an infant's heart. The objective is to aid clinicians in evaluating congenital heart disease (CHD) in infants whose hearts require continuous monitoring. Massive and time-series CMR data makes it more challenging to manage. Examining the many regions of the heart manually using CMR is laborious for clinicians, and my goal is to automate this procedure using machine learning techniques

EDUCATION

PhD student in Computer Science

University of Colorado Boulder, USA Aug 2022 – Present
Supervisor: Dr. Tom Yeh

MSc. in Computer Science

University of Calgary, Canada Sep 2014 – Dec 2016
Supervisor: Dr. Usman R. Alim
Thesis: "Icosahedral Maps for a Multiresolution Representation of Earth Data"
Url: hdl.handle.net/11023/3527

BSc. in Computer Science & Information Technology

Islamic University of Technology, Bangladesh Jan 2008 – Oct 2011 Thesis: "An Enhanced Decision Based Adaptive Median Filtering Technique to Remove
Salt and Pepper Noise in Digital Images"

INTERESTS

• Computer Vision • Human Centered Computing • Computer Graphics • Visualization

FELLOWSHIPS AND GRANTS

Early Career Professional Development Fellowship (1st year in PhD), Aug 2022
University of Colorado Boulder.
Amount: 1000 USD

Departmental Fellowship (1st year in PhD), Aug 2022
University of Colorado Boulder.
Amount: 4000 USD

Grant for *VISAPP 2022*, Nov 2021
International Joint Conference on Computer Vision, Imaging
and Computer Graphics Theory and Applications
In the form of registration fee.

Grant for *Workshop on MOODLE*, Jun 2021
Ahasanullah University of Science & Technology,
Engelbert Strauss and Deutsche Gesellschaft für Internationale Zusammenarbeit
Amount: 15000 BDT

Grant for implementing *Technology-enabled Learning*, Dec 2019
COL-TEL Project at Ahasanullah University of Science & Technology.
Amount: 20000 BDT

Grant for participating *Teaching for Active Learning Course*, Aug 2018
Ahasanullah University of Science & Technology.
Amount: 10000 BDT

Workshop Grant, German Climate Computing Center (DKRZ). Oct 2016
In the form of transportation and accommodation.

CPSC Travel Award, University of Calgary. Oct 2016
Amount: 1200 CAD

Research Award (2nd year of MSc), University of Calgary. Sep 2015
Amount: 6000 CAD

Research Award (1st year of MSc), University of Calgary. Sep 2014
Amount: 6000 CAD

International Recruitment Graduate Award, University of Calgary. Sep 2014
Amount: 2000 CAD

International Student Differential Fee Reimbursement Award,
University of Calgary. Sep 2014
Amount: 4126.17 CAD

OIC Undergraduate Student Scholarship, Islamic University of Technology. Jan 2008
Amount: 12000 USD

RESEARCH EXPERIENCE

Research Collaboration Sep 2022 – Present
with Dr. Mehdi Hedjazi Moghari, CU Anschutz Medical Campus.

- *Description:* Deep learning-based segmentation of 3D cine MRI of infant's heart to investigate congenital heart disease.

Research Collaboration Nov 2020 – Jul 2022
with Dr. Helge Rhodin, University of British Columbia.

- *Description:* As an alternative to using the checkerboard as a reference, I'm working on building a camera calibration system that uses gravity as a reference.

Member, AI Team Aug 2020 – Present

Sewer Cleaning Robot Project for Dhaka city,
with Center for Robotic Innovation and Development USA (CRID USA))
and Dhaka North City Corporation.

- *Description:* Working as a member of a team that is tasked with facilitating the AI component of a project to construct a robot for sewer cleaning. In order to accomplish this, sensors will be installed throughout Dhaka's drainage system. We want to create a map depicting the current condition of the drainage system based on the data collected from sensors and predict future conditions using AI.

Undergraduate Research Supervisor Mar 2018 – Present

Department of CSE,
Ahsanullah University of Science and Technology, Bangladesh.

Research Assistant Sep 2014 – Dec 2016

Visualization & Graphics Group (VISAGG) at Graphics Jungle,
University of Calgary.

Undertaken tasks:

- Explored different NetCDF-based climate models and *Digital Earths* and investigated their data structures.
- Applied Atlas of Connectivity Maps (ACM) on a climate model.
- Developed a method called "Icosahedral Maps" to extend ACM and applied hexagonal wavelets on a model for multiresolution visualization.

Research Collaboration Nov 2014 – Dec 2016

with German Climate Computer Center (DKRZ), Hamburg.
and National Center for Atmospheric Research (NCAR), USA.

Undertaken tasks:

- Applied "Icosahedral Maps" on the ICON (Icosahedral Nonhydrostatic) model and made it applicable for all types of cells of ICON.
- Applied multiresolution visualization on *Hurricane Gaston*, *HD(CP)2* and *Agulhas Current* datasets using "Icosahedral Maps".
- Worked with domain experts, and climatologists & collected feedback.

TEACHING EXPERIENCES

Faculty Member, May 2017– Aug 2022

Department of Computer Science,
Ahsanullah University of Science and Technology.

- equivalent to *Lecturer in North American System*

LMS Trainer, Jun 2021

Ahsanullah University of Science and Technology.

- Description: *I trained teachers from the department of Textile Engineering to use Learning Management System (LMS), i.e. MOODLE. I conducted a workshop on MOODLE funded by the project of AUST in collaboration with Engelbert Strauss and Deutsche Gesellschaft für Internationale Zusammenarbeit*

Teaching Assistant, Department of Computer Science, University of Calgary. Sep 01, 2014 – Dec 31, 2016

Lecturer, Department of Computer Science and Engineering, Ahsanullah University of Science and Technology. Oct 01, 2012 – Aug 23, 2014

- equivalent to *Lab Instructor in North American System*

SKILLS

Python (PyTorch, Keras), MATLAB, C, C++, Modern OpenGL, WebGL, CUDA, Unity3D.

Repositories: *github.com/imruljubair*

TRAINING

Coursera Project Certificate: *Deep Learning with PyTorch : Image Segmentation*.
offered by **Coursera Project Network**. Jan 20, 2023

Coursera Certificate: *Deep Learning Applications for Computer Vision.*
offered by **University of Colorado Boulder**. Jan 18, 2023

edX Certificate Course: *CSE167x – Computer Graphics*.
offered by **UCSanDiegoX**, an online learning initiative of UC San Diego. May 1, 2020

Trainee, *Designing and developing Moodle-enabled Blended learning*.
offered by **Commonwealth of Learning (COL)**. Jun 25, 2019 – Jun 27, 2019

Trainee, *Teaching for Active Learning Course*, Aug 30, 2018 – Sep 1, 2018
offered by **Foundation for Learning, Teaching and Research**.

Trainee, Asia Pacific Communication Limited, Bangladesh. Oct 18, 2010 – Nov 25, 2010

PUBLICATIONS

- Simanta Deb Turja, **Mohammad Imrul Jubair**, Md. Shafiur Rahman, Md. Hasib Al Zadid, Mohtasim Hossain Shovon, and Md. Faraz Kabir Khan. Shapes2toon: Generating cartoon characters from simple geometric shapes, 2022. Accepted at ACS/IEEE International Conference on Computer Systems and Applications **(AICCSA 2022)** [CORE rank C]
- Emdadul Haque, Md. Faraz Kabir Khan, **Mohammad Imrul Jubair**, Jarin Anjum, and Abrar Zahir Niloy. Book cover synthesis from the summary. *to be appeared*, 2022. Accepted at ACS/IEEE International Conference on Computer Systems and Applications **(AICCSA 2022)** [CORE rank C]
- **Mohammad Imrul Jubair**, Ali Ahnaf, Tashfiq Nahiyan Khan, Ullash Bhattacharjee, and Tanjila Joti. Persign: Personalized bangladeshi sign letters synthesis. In *The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology*, **UIST** Adjunct, New York, NY, USA, 2022. Association for Computing Machinery. [CORE rank A*]
- **Mohammad Imrul Jubair**, Arafat Ibne Yousuf, Tashfiq Ahmed, Hasanath Jamy, Foisal Reza, and Mohsena Ashraf. DIY Graphics Tab: A Cost-Effective Alternative to Graphics Tablet for Educators. In *The Adjunct Publication of the 35th Annual ACM Symposium on User Interface Software and Technology*, **UIST** Adjunct, New York, NY, USA, 2022. Association for Computing Machinery. [CORE rank A*]

- **Mohammad Imrul Jubair**, Arafat Ibne Yousuf, Tashfiq Ahmed, Hasanath Jamy, Foisal Reza, and Mohsena Ashraf. DIY Graphics Tab: a cost-effective alternative to graphics tablet for educators. *arXiv preprint arXiv:2112.03269*, 2022. Accepted at AAAI Conference on Artificial Intelligence **(AAAI workshop)** [CORE rank A*]
- **Mohammad Imrul Jubair**, Md. Masud Rana, Md. Amir Hamza, Mohsena Ashraf, Fahim Ahsan Khan, and Ahnaf Tahseen Prince. Altering facial expression based on textual emotion. In Giovanni Maria Farinella, Petia Radeva, and Kadi Bouatouch, editors, *Proceedings of the 17th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications, **VISIGRAPP** 2022, Volume 4: VISAPP, Online Streaming, February 6-8, 2022*, pages 917–924. SCITEPRESS, 2022. [CORE rank B]
- MD Tanvir Rouf Shawon, Raihan Tanvir, Humaira Ferdous Shifa, Susmoy Kar, and **Mohammad Imrul Jubair**. Jamdani motif generation using conditional gan. In *2020 23rd International Conference on Computer and Information Technology (ICCIT)*, pages 1–6. IEEE, 2020
- Syed Sanzam, Sourav Govinda Das, **Mohammad Imrul Jubair**, Md Faisal Ahmed, et al. Image-to-image attire transfer for virtual trial room. In *2020 23rd International Conference on Computer and Information Technology (ICCIT)*, pages 1–6. IEEE, 2020
- KM Arefeen Sultan, **Mohammad Imrul Jubair**, MD Nahidul Islam, and Sayed Hossain Khan. toon2real: Translating cartoon images to realistic images. In *2020 IEEE 32nd International Conference on Tools with Artificial Intelligence **(ICTAI)***, pages 1175–1179. IEEE, 2020. [CORE rank B]
- Oishee Bintey Hoque, **Mohammad Imrul Jubair**, Al-Farabi Akash, and Md Saiful Islam. Bdsl36: A dataset for bangladeshi sign letters recognition. In *Asian Conference on Computer Vision **(ACCV Workshops)***, pages 71–86, 2020. [CORE rank B]
- KM Arefeen Sultan, Labiba Kanij Rupty, Nahidul Islam Pranto, Sayed Khan Shuvo, and **Mohammad Imrul Jubair**. Cartoon-to-real: An approach to translate cartoon to realistic images using gan. *CoRR*, 2018. Presented as a poster at international conference on innovation in engineering and technology (ICIET)
- Oishee Bintey Hoque, **Mohammad Imrul Jubair**, Md Saiful Islam, Al-Farabi Akash, and Alvin Sachie Paulson. Real time bangladeshi sign language detection using faster r-cnn. In *2018 international conference on innovation in engineering and technology (ICIET)*, pages 1–6. IEEE, 2018
- **Mohammad Imrul Jubair**, Usman Alim, Niklas Röber, John Clyne, and Ali Mahdavi-Amiri. Icosahedral maps for a multiresolution representation of earth data. In *Proceedings of the Conference on Vision, Modeling and Visualization*, **VMV 2016**, page 161–168, Goslar, DEU, 2016. Eurographics Association
- **Mohammad Imrul Jubair**. Icosahedral maps for a multiresolution representation of earth data. https://prism.ucalgary.ca/handle/11023/3527, 2017. Msc thesis

- **Mohammad Imrul Jubair**, Usman Alim, Niklas Roeber, John Clyne, Ali Mahdavi-Amiri, and Faramarz Samavati. Multiresolution visualization of digital earth data via hexagonal box-spline wavelets. In *2015 IEEE Scientific Visualization Conference **(VIS)** [CORE rank A]*, pages 151–152. IEEE, 2015
- **Mohammad Imrul Jubair** and Prianka Banik. A technique to detect books from library bookshelf image. In *2013 IEEE 9th International Conference on Computational Cybernetics **(ICCC)** [CORE rank C]*, pages 359–363. IEEE, 2013
- **Mohammad Imrul Jubair** and Prianka Banik. An approach to extract features from document image for character recognition. *Global Journal of Computer Science and Technology Graphics & Vision*, 13(2):7, 2013
- **Mohammad Imrul Jubair**, Imtiaz Masud Ziko, Syed Ashfaqueuddin, and Md Helal Uddin. An improved adaptive filtering technique to remove high density salt-and-pepper noise using multiple last processed pixels. *Global Journal of Computer Science and Technology Graphics & Vision*, 12(14):7, 2012
- **Mohammad Imrul Jubair** and Prianka Banik. A simplified method for handwritten character recognition from document image. *International Journal of Computer Applications*, 51(14), 2012
- **Mohammad Imrul Jubair** and Moumita Dey. An enhanced adaptive vector median filtering technique to remove high density salt-and-pepper noise from microarray image. *International Journal of Computer Applications*, 45(13):23–16, 2012
- Faisal Ahmed Mohammad, **Mohammad Imrul Jubair**, and Imtiaz Masud. An enhanced non-linear adaptive filtering technique for removing high density salt-and-pepper noise. *International Journal of Computer Applications*, 975:8887, 2012
- **Mohammad Imrul Jubair**, Md Mizanur Rahman, Syed Ashfaqueuddin, and Imtiaz Masud Ziko. An enhanced decision based adaptive median filtering technique to remove salt and pepper noise in digital images. In *14th International Conference on Computer and Information Technology (ICCIT 2011)*, pages 428–433. IEEE, 2011

Google Scholar: scholar.google.com/citations?hl=en&user=H4-yZ3wAAAAJ

SELECTED COURSE PROJECTS

Mining the Insights of Stack Oveflow Developer Survey Sep 2022
Course: CSCI 601 – Data Mining, Fall 2022, CU Boulder.
Language: Python

Implementing Atlas of Connectivity Maps for ICON Grid Sep 2014
Course: CPSC 601 – Visualization of Scientific Data, Fall 2014, UofC.
Language: MATLAB [*github.com/imruljubair/SciVis-Course-Project-Fall-2014*]

A Very Simple Raytracer Oct 2014
Course: CPSC 601 – Visualization of Scientific Data, Fall 2014, UofC.
Language: C++ [*github.com/imruljubair/a-very-simple-raytracer*]

B-Spline Curve Simulator Jan 2015
Course: CPSC 689 – Modelling for Computer Graphics, Winter 2015, UofC.
Language: OpenGl (legacy) & C [*github.com/imruljubair/B-Spline-Curve-Simulator*]

GPU based Multiresolution Visualization of ICON Data Jan 2015
Course: CPSC 691 – Rendering, Winter 2015, UofC.
Language: GLSL & C [*github.com/imruljubair/Visualization-using-GLSL*]

Environment Mapping using Texture Map Feb 2015
Course: CPSC 691 – Rendering, Winter 2015, UofC.
Language: OpenGl (legacy) & C [*github.com/imruljubair/Environment-Mapping-using-Texture-map*]

A Game using OpenGL May 2010
Course: CIT 4506 – Computer Graphics & Multimedia Systems Lab, IUT.
Language: OpengGl (legacy) & C [*github.com/imruljubair/A-Game-with-old-OpenGL*]

A Bank Account Management System Oct 2009
Course: CIT 4502 – Visual Programming Lab, IUT.
Language: Java & MySQL

TALKS

Talk on – *"Using Wavelets to Compress ICON and MPAS data sets"*.
Host: German Climate Computing Center (DKRZ), Germany. Oct 14, 2016

Seminar talk on – *"Icosahedral Maps for a Multiresolution Representation of Earth Data"*.
Host: Department of Computer Science, University of Calgary. Dec 02, 2016

Presentation on – *"Icosahedral Maps for a Multiresolution Representation of Earth Data"*, at VMV 2016, Bayreuth. Oct 2016

Presentation on – *"CUDA Programming Basics"*, at VISAGG Reading group seminar, University of Calgary. Mar 2016

Presentation on – *"A Hexagonal Box Spline Wavelet for Level of Detail Visualization of Digital Earth Data"*, at Computer Science Industrial Day 2015, University of Calgary. Dec 2015

Talk on – *"Tessellation: Getting Started"*, at Grad Seminar Series (CPSC 691 Rendering Course), University of Calgary. Mar 2015

Presentation on – *"An Enhanced Decision Based Adaptive Median Filtering Technique to Remove Salt and Pepper Noise in Digital Images"*, at ICCIT 2011, Dhaka. Dec 2011

EXTRA-CURRICULAR ACTIVITIES

Co-Chair, BAIVC Student Symposium (BAIVC23), Feb 2023

- It is a mini-conference organized by students from **the Center for Brain, AI, and Child (BAIC)** and **Image and Video Computing (IVC)** groups at the University of Colorado Boulder, directed by Professors Tom Yeh and Danna Gurari, respectively. The name BAIVC is derived from the initials of our two labs. I am serving as a co-chair of this symposium.

Member, Institute for Systems and Technologies of Information, Control and Communication (INTICC), Portugal Nov 2021

Member, Committee of Outcome Based Education, Nov 2020 — Jul 2022
Ahsanullah University of Science and Technology.

Member, Technical Sub-committee, Nov 2020
23^{rd} International Conference on Computer and Information Technology 2020.

Convener, Programming Contest, *CSE WEEK 2018*, Jul 2018
Ahsanullah University of Science and Technology.

Vice President, Islamic University of Technology Computer Society. Nov 2010 – Oct 2011

Microsoft Student Partner, Islamic University of Technology. Jan 2011 – Oct 2011

Organizing Member, IUT 3rd National ICT Fest, Bangladesh. Apr 2011

Participant, Intra IUT Programming Contest. 2008

Participant, Intra IUT Debate Competition. 2008

YouTube Channel (animation & teaching): *youtube.com/user/jubairization*

REFERENCES

Dr. Tom Yeh
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University of Colorado Boulder, Engineering Dr, Boulder, CO 80302
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