# Mohammad Imrul Jubair

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| **CURRENT POSITION** | **Graduate Research and Teaching Assistant**, | Aug 2022 – Present |
| | • Department of Computer Science, Present | |
| | • University of Colorado Boulder, USA | |

**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
- CGPA: 3.775 / 4.00
- Courses: *Visualization of Scientific Data, Modelling for Computer Graphics, Rendering,* and *Image analysis & Computer Vision*
- 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

- CGPA: 3.85 / 4.00
- 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

**AWARDS, SCHOLARSHIPS AND GRANTS**

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

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

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

- **Grant** for *Workshop on MOODLE*, Ahasanullah University of Science & Technology, Engelbert Strauss and Deutsche Gesellschaft für Internationale Zusammenarbeit — Jun 2021
  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 Collaborator** Nov 2020 – Present
  *with* Dr. Helge Rhodin, University of British Columbia.
  - *Description:* As an alternative to using the checker board 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 condition 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 Collaborator**                                   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, climatologists & collected feedback.

**OTHER EXPERIENCES**

- **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,     Sep 01, 2014 – Dec 31, 2016

  University of Calgary.
  - Conducted Course: *Introduction to Computer Science for Multidisciplinary Studies* (Python)

- **Lecturer**, Department of Computer Science and Engineering,   Oct 01, 2012 – Aug 23, 2014

  Ahsanullah University of Science and Technology.
  - equivalent to *Lab Instructor*
  - Conducted Course: *Computer Graphics (OpenGL), Distributed Database Management System (PL/SQL)*

**TRAINING**

- **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

**SKILLS**   Python (PyTorch), MATLAB, C, C++, modern OpenGL, WebGL, CUDA, Unity3D.

**Repositories:** *github.com/imruljubair*

**PUBLICATIONS**

- **Mohammad Imrul Jubair**, Ali Ahnaf, Tashfiq Nahiyan Khan, Ullash Bhattacharjee, and Tanjila Joti. Persign: Personalized bangladeshi sign letters synthesis. *arXiv preprint arXiv:2209.14591*, 2022. Accepted at The ACM Symposium on User Interface Software and Technology **(UIST2022)** [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:2209.14586*, 2022. Accepted at The ACM Symposium on User Interface Software and Technology **(UIST2022)** [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 2022 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. *arXiv preprint arXiv:2112.01454*, 2022. Accepted at International Conference on Computer Vision Theory and Applications **(VISAPP 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) [CORE rank B]*, pages 1175–1179. IEEE, 2020

- 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) [CORE rank B]*, pages 71–86, 2020

- 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*, **VMV2016**, 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**

- **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

**RESEARCH PROJECTS**

**DIY Graphics Tablet** [*1 paper published*]     2021
- A method that will allow users to get the facilities of a graphic tablet but without having a real one. Users can simply tilt the laptop's lid to record a paper in front of it and the tool captures the users' stroke on the paper and store them digitally on a digital canvas with perspective warp.

**Editing Bengali Text in the Wild** [*ongoing*]     2021
- A method that will allow editing Bengali text in natural images so that the edited image is visually the same as the source image in terms of the background and text styles.

**Generating Covers from the Book Summary** [*ongoing*]     2021
- A method where the summary of a book will be inputted and a cover will be synthesized using GAN. A dataset is currently being developed from book cataloging sites, i.e. goodreads.

**Cartoon from Geometric Shapes** [*ongoing*]     2020
- A tool where the user provides simple geometric approximations, i.e. circles, quads, ellipse, etc. and a cartoon character will be created based on that.

**Jamdani Motif Generation using GAN** [*1 paper published*] [*short-listed for **UNIBATOR***]     2020
- An AI based tool for designer where users can input the skeleton of a desired pattern in terms of rough strokes and our system finalizes the input by generating the complete motif which follows the geometric structure of real Jamdani ones.

**Toon2real** [*1 paper published*]     2018
- Translating cartoon-styled images into their real-world scenes using GAN.

**Bangladeshi Sign Language Detection** [*2 papers published*]     2018
- We introduce a dataset named *BdSL36* contains over four million images belonging to 36 categories and employ different state-of-the-art models to justify the possibilities of real-world application with this dataset.

**WhYMYFace: What's in Your Mind is in Your Face!** [*1 paper published*]                    2018

- An application that aims to transfer the emotions from a social media/ blog post of a user to his or her facial expression in the profile picture.

**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

**MISCELLANEOUS**

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

- **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. Usman R. Alim**

  pages.cpsc.ucalgary.ca/ ualim/

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- **Dr. Tom Yeh**

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*[CV updated on 2022-10-02]*