Dr Debajyoti Karmaker
PhD, MS, BS Computer Science

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Born 29th September 1984, Bangladesh

I am a Postdoctoral Research Fellow at Australian National University (ANU), currently hosted by Dr. Hanna Kurniwati. Before joining ANU, I completed my Ph.D. from The University of Queensland (UQ) on September, 2019, under the supervision of Prof. Mandyam V. Srinivasan. My research interests are in computer vision, machine learning, and deep learning. I am particularly interested in the areas of collision avoidance strategies, Robust Decision-making and Learning, and Object detection. Before starting my PhD, I was working as a lecturer at the American International University-Bangladesh (AIUB) - in the department of Computer Science. I also worked as a software engineer at Infra Blue Technology (IBT Games).

Research Interest

- Computer Vision
- Machine Learning
- Deep Learning
- Biologically-inspired mid-air collision avoidance strategies for Unmanned Aircraft Systems (UAS)
- Decision-making under uncertainty

Current Position

- **Postdoctoral Research Fellow**
  Robust Decision-making and Learning (RDL) Lab
  Australian National University (ANU), Australia.
  https://cecs.anu.edu.au/people/debajyoti-karmaker

Work Experience

August 2019 – May 2018 — **Research Assistant, Queensland Brain Institute (QBI), Australia**
- Conduct experimental investigation of visually guided bird flight
- Develop computer vision algorithms for reliable automated detection of birds in videos and still images, automatic identification and localization of their parts (head, tail, wingtips)
- Data analysis and modeling of biologically inspired guidance laws and algorithms for avoiding mid-air collisions in unmanned aircraft systems (UAS)

May 2015 – September 2013 — **Assistant Professor, Department of Computer Science, American International University (AIUB), Bangladesh**
- Developing materials for lectures, tutorials, assignments, lab demonstrations and exams.
- Deliver lectures and motivate students to take part in classroom discussions.
- Conduct independent research and supervise final year undergraduate research projects.
- Assist students during course enrollment.
- Organize workshops and seminars.

August 2013 – September 2010 — **Lecturer, Department of Computer Science, American International University (AIUB), Bangladesh**
- Deliver lectures and motivate students to take part in classroom discussions.
- Provide students with academic advices during consultation hours.
- Assist students during course enrollment.
- Organize workshops and seminars.

August 2010 – September 2008 — **Software Engineer, Infra Blue Technology (IBT Games), Bangladesh**
- Coordinate with the Technical Director on current programming tasks.
- Collaborate with other programmers to design and implement features.
- Quickly produce well-organized, optimized, and documented source code.
- Create and document software tools required by artists or other developers.
- Debug existing source code and polish feature sets.
- Contribute to technical design documentation.
- Work independently when required.
- Continuously learn and improve skills.

PHP | Python | Data analysis | Communication | Explanation | Leadership | Team work

Education

September 2019 July 2015	**PhD in Computer Science, The University of Queensland (UQ), Australia** Thesis topic: *Mid-air Collision Avoidance in Budgerigars and Potential Applications to UAV Guidance* Supervisor: Professor Mandyam Srinivasan
January 2011 June 2009	**M. Sc in Computer Science, American International University (AIUB), Bangladesh** Thesis: A fine grained technique for viral marketing based on social network: A machine learning approach. Supervisor: Dr. Saiedur Rahman
February 2009 January 2005	**B. Sc in Computer Science & Software Engineering, American International University (AIUB), Bangladesh** Thesis: Global Motion tracking with six parameter model. Supervisor: Dr. Ashfaqur Rahman

Research Publications

December 2018	**D Karmaker**, J Groening, I Schiffner, M Wilson, M V Srinivasan, **Budgerigars adopt robust, but idiosyncratic flight paths**, *Nature Scientific reports*, doi: 10.1038/s41598-020-59013-3
December 2018	**D Karmaker**, I Schiffner, M Wilson, M V Srinivasan, **Image denoising with Weighted ORientation-Matched Filters(WORM)**, *15th IEEE International Conference on Robotics and Biomimetics (IEEE ROBIO)* , doi: 10.1109/ROBIO.2018.8665336
November 2018	**D Karmaker**, I Schiffner, M Wilson, M V Srinivasan, **The bird gets caught by the WORM: tracking multiple deformable objects in noisy environments using Weight ORdered logic Maps** , *13th International Symposium on Visual Computing (ISVC)*, doi: 10.1007/978-3-030-03801-4_30
January 2018	T L Molloy, G S Garden, T Perez, I Schiffner, **D Karmaker**, M V Srinivasan, **An Inverse Differential Game Approach to Modelling Bird Mid-Air Collision Avoidance Behaviours** , *8th IFAC Symposium on System Identification SYSID*, doi: 10.1016/j.ifacol.2018.09.164
January 2016	**D Karmaker**, I Schiffner, R Strydom, M V Srinivasan, **WHoG: A weighted HoG-based scheme for the detection of birds and identification of their poses in natural environments** , *14th International Conference on Control, Automation, Robotics and Vision (ICARCV)*, doi: 10.1109/ICARCV.2016.7838650
December 2015	M F Zaman, S T Mossarrat, F Islam, **D Karmaker**, **Real-time hand detection and tracking with depth values**, *International Conference on (ICAEE)*, doi: 10.1109/ICAEE.2015.7506813
May 2015	MA Imran, MSU Miah, H Rahman, A Bhowmik, **D Karmaker**, **Face recognition using eigenfaces**, *International Journal of Computer Applications*, Volume: 118 – No. 5
April 2015	**D Karmaker**, AZME Chowdhury, MSU Miah, MA Imran, MH Rahman, **Cricket shot classification using motion vector**, *2nd International Conference on Computing Technology and Information Management (ICCTIM)*, doi: 10.1109/ICCTIM.2015.7224605
December 2014	M A U Rahman, M S U Miah, M A Fahad, **D Karmaker**, **SHIMPG: Simple human interaction with machine using Physical Gesture**, *13th International Conference on Control Automation Robotics & Vision (ICARCV)*, doi: 10.1109/ICARCV.2014.7064322
October 2011	H Rahman, **D Karmaker**, M S Rahaman, N Sultana, **SMESRT: A protocol for multiple event-to-sink reliability in WSN**, *International Journal of Engineering and Technology*, Volume: 1 – No. 1
August 2011	**D Karmaker**, H Rahman, M S Rahaman, M K Bari, **A fine grained technique for viral marketing based on social network: A machine learning approach**, *International Journal of Science and Technology*, Volume: 1 – No. 5

Papers Under Submission

1. **D Karmaker**, I Schiffner, and M V Srinivasan. **"Budgerigars adopt robust, but idiosyncratic flight paths"**
   Accepted for `Nature Scientific Reports`, 2019
   Project paage: https://debajyotikarmaker.github.io/profile/preset_path.html
2. **D Karmaker**, I Schiffner, J Groening, and M V Srinivasan. **"Stretching Time and Space: How flying Budgerigars evade a moving obstacle"**
   Submitted to `Proceedings of the Royal Society`, 2019
   Project paage: https://debajyotikarmaker.github.io/profile/pendulum.html
3. **D Karmaker**, and M V Srinivasan. **"Ballistic collision avoidance in Budgerigars"**
   Submitted to `Nature Communications`, 2019
   Project paage: https://debajyotikarmaker.github.io/profile/ballistic.html
4. **D Karmaker**, I Schiffner, J Groening, and M V Srinivasan. **"Guidance laws for avoiding a bird-like obstacle"**
   Submitted to `Journal of Experimental Biology`, 2019
   Project paage: https://debajyotikarmaker.github.io/profile/guidance_law.html

Conference Attendance, Posters and Talks

December, 2018	Oral presentation - "Image denoising with Weighted ORientation-Matched filters (WORM)" @ 15th IEEE International Conference on Robotics and Biomimetics **(IEEE ROBIO)**, Kuala Lumpur, Malaysia
December, 2018	Annual Presentation @ Boeing Defence Australia **(BDA)**, Brisbane, Australia
November, 2018	Oral presentation - "The bird gets caught by the WORM: tracking multiple deformable objects in noisy environments using Weight ORdered logic Maps" @ 13th International Symposium, International Symposium on Visual Computing **(ISVC)**, Las Vegas, NV, USA
July, 2018	Poster presentation - "Budgerigar flight: Guidance laws for avoiding an stationary obstacle" @ International Conference of Neuroethology **(ICN)**, Brisbane, Australia
July, 2018	Poster presentation - "Budgerigar flight: Guidance laws for avoiding an stationary obstacle" @ Queensland Brain Institute & Munich Center for Neurosciences **(QBI-MCN)**, Brisbane, Australia
May, 2018	Tutorial on Deep Learning for Robotics Perception in the International Conference on Robotics and Automation **(ICRA)**, Brisbane, Australia
December, 2017	Annual Presentation @ Boeing Defence Australia **(BDA)**, Brisbane, Australia
December, 2016	Annual Presentation @ Boeing Defence Australia **(BDA)**, Brisbane, Australia
November, 2016	Poster presentation - "WHoG: A weighted HoG-based scheme for the detection of birds and identification of their poses in natural environments" @ 9th Australasian Workshop on Neuro-Engineering and Computational Neuroscience (**NeuroEng**), Brisbane, Australia
November, 2016	Workshop on Deep Learning: An Introduction for Neuroscientists and Modellers (**NeuroEng**), Brisbane, Australia
November, 2016	Oral presentation - "WHoG: A weighted HoG-based scheme for the detection of birds and identification of their poses in natural environments" @ 14th International Conference on Control, Automation, Robotics and Vision **(ICARCV)**, Phuket, Thailand
December, 2014	Oral presentation - "SHIMPG: Simple human interaction with machine using physical gesture" @ 13th International Conference on Control, Automation, Robotics and Vision **(ICARCV)**, Marina Bay Sands, Singapore

Teaching Experience

- **Courses instructed as Assistant Professor at AIUB (September 2013 – May 2015)**
  - Computer Vision and Pattern Recognition (CSC 4138)
  - Algorithms (CSC 2211)
  - Web Technologies (CSC 3222)
  - Programming Language 1 (CSC 1102)
  - Programming Language 2 (CSC 1203)
  - Object Oriented Programming 1 (CSC 2209)
  - Object Oriented Programming 2 (CSC 3115)
- **Courses instructed as Lecturer at AIUB (September 2010 – August 2013)**
  - Programming Language 1 (CSC 1102)
  - Programming Language 2 (CSC 1203)
  - Object Oriented Programming 1 (CSC 2209)
  - Web Technologies (CSC 3222)

Achievements and Awards

2018	QBI Travel Allowance
2015 – 2018	UQ International Scholarship (UQI)
2015 – 2018	Boeing - UQ Research Alliance PhD Scholarship
2014	Research Support grant *(American International University-Bangladesh (AIUB))*
2011	Chairmans Award *(American International University-Bangladesh (AIUB))*
2011	Summa Cum Laude *(American International University-Bangladesh (AIUB))*

Skills

Deep Learning Frameworks	**TensorFlow**, **Keras**, PyTorch
Programming	**Python**, **MATLAB**, C, C++, Java, Microsoft .Net (C#)
Web Development	**PHP**, **java Script**, ASP .Net, J2EE, Flash, Flex, Action Script, CSS
Database	Oracle Database, **MySQL**, Microsoft SQL Server
Software	Microsoft Office (Word, Excel, Powerpoint), LaTeX, Adobe (Photoshop, Illustrator)
Development tools	Eclipse, Visual Studio, gcc, SVN, git, Spyder, **Jupyter Notebook**, **Visual Studio Code**
Operating Systems	Mac OS X, Windows (98 – 10), Linux (**Ubuntu**, CentOS, Arch)

Strengths

- Strong problem solving skill
- Excellent presentation skill and proficient in technical writing

- Self-motivated and ability to work both independently or in a team
- Strong interpersonal and leadership qualities

Extra-Curricular Activities

- Strong problem solving skill
- Excellent presentation skill and proficient in technical writing
- Self-motivated and ability to work both independently or in a team
- Strong interpersonal and leadership qualities

Références

Prof. Mandyam V. Srinivasan
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