

Junaed Sattar, PhD

- CONTACT INFORMATION** Department of Computer Science and Engineering
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<http://www.cs.umn.edu/~junaed>
- RESEARCH INTERESTS** Mobile and Field Robotics (particular focus on Underwater Robotics), Human-Robot Interaction, Computer Vision, Machine Learning, Assistive Robotics, Software Engineering, Software Systems for Robotics, Distributed Sensor Networks, Sports Analytics, Data Mining.
- CURRENT POSITION** **University of Minnesota**, Minneapolis, Minnesota, USA.
Assistant Professor **January 2016 –**
Department of Computer Science and Engineering **www.cs.umn.edu**
Founding Director, Interactive Robotics and Vision Laboratory **irvlab.cs.umn.edu**
- PREVIOUS POSITIONS**
- Clarkson University**, Potsdam, New York, USA.
Assistant Professor **August 2014 – December 2015**
Department of Computer Science
- University of British Columbia**, Vancouver, British Columbia, Canada.
Post-doctoral Fellow **January 2012 – June 2014**
Department of Computer Science
- Primarily funded by the B3 (Post-Doctoral Scholarship) from Fonds de Recherche du Québec – Nature et Technologies, for the period January 2012 – June 2014.
 - Advisor: Professor James Little.
 - Supplementary funding from the CanWheel project on smart sensing and mobility for power wheelchairs. *Principal Investigators:* Professors Ian Mitchell, James Little and Alan Mackworth.
 - Laboratory for Computational Intelligence, Department of Computer Science.
 - Teaching Post-doctoral Fellow; Department of Mechanical Engineering.
- CONSULTING** **Kinsol Research Incorporated**, Victoria, British Columbia, Canada.
Consulting Developer **January 2012 –**
- EDUCATION** **McGill University**, Montréal, Québec, Canada.
- Ph.D., School of Computer Science, November 2011 (Degree granted: February 2012)
- Thesis Topic: *Towards a Robust Framework for Visual Human-Robot Interaction.*
 - Advisor: Professor Gregory L. Dudek
 - Area of Study: Sensor-based Mobile Robotics and Human-Robot Interaction.
- M.Sc., School of Computer Science, August 2005 (Degree granted: February 2006)
- Thesis Title: *A Visual Servoing System for an Amphibious Legged Robot.*
 - Advisor: Professor Gregory L. Dudek
 - Area of Study: Sensor-based Mobile Robotics, Marine Robotics, Machine Vision.

Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

B.Sc. (Engineering) Computer Science and Engineering, August 2001

- Double Major equivalent in Computer Science and Computer Engineering.
- Thesis Topic: *Discovery of Patterns from Databases– an Evaluation of Methods in Knowledge Discovery.*
- GPA 3.73, 161 credit hours.

AWARDS

- [A10] University of British Columbia Post-Doctoral Association. Best Presentation Award for the talk titled “From the Deep Seas to Our Homes– Towards a Seamless Interface for Human-Machine Interaction”. Post-doctoral Research Day. September 2012. Vancouver, Canada.
- [A9] Fonds de Recherche du Québec – Nature et Technologies (FQNRT) post-doctoral award (B3), ranked 4th among 9 candidates chosen for final consideration. 2011-2013, Quebec, Canada.
- [A8] National Science and Engineering Research Council (NSERC) Industrial Research and Development Fellowship (IRDF) post-doctoral award, 2009.
- [A7] Best Robotics Paper Award, Canadian Conference on Robot Vision (CRV), 2009, Kelowna, British Columbia, Canada.
- [A6] Fonds de Recherche du Québec – Nature et Technologies (FQNRT) Doctoral Award (B2), ranked 5th among 26 candidates chosen for final consideration. 2008-2009, Quebec, Canada.
- [A5] Best Presentation Award, in “Electromagnetism: transmission across disciplines” entitled “A Vision-based Interaction Framework for Mobile Robots in Arbitrary Environments”, The Fifth Interdisciplinary Graduate Student Research Symposium, McGill University, Montréal, Canada, April 2008.
- [A4] “Precarn Scholar” for research contributing to industrial applications, 2007-2008. Canada.
- [A3] “Precarn Scholar” for research contributing to industrial applications, 2005-2006. Canada.
- [A2] Dean’s Honor List, Bangladesh University of Engineering and Technology, Dhaka, 1998-’99.
- [A1] Prime Ministers Award for excellence in Secondary School and Higher Secondary Certificate Examinations, 1992 and 1994 respectively. Dhaka, Bangladesh.

ORGANIZATION

- [ORG1] Co-chair, inaugural Robotics and AI Multimedia Fair (with James J. Little), Twenty-Sixth Conference on Artificial Intelligence (AAAI-12). Toronto, Ontario, Canada.

PUBLICATIONS List of publications available at
<http://www.cs.umn.edu/~junaed/index.php/Research/Publications>

TEACHING
EXPERIENCE

Clarkson University, Potsdam, NY, USA.

Instructor, Department of Computer Science **Fall 2014 – December 2015**

- Instructor, CS242, Advanced Programming Concepts in Java. Fall 2014.
- Instructor, CS465/665, Mobile Robotics and Human-Robot Interaction. Spring 2015.
- Instructor, CS444/644, Operating Systems. Spring 2015.

The University of British Columbia, Vancouver, BC, Canada

Lecturer, Department of Mechanical Engineering **Winter 2014**

- Instructor, MECH563/464, Industrial Robotics.

McGill University, Montréal, QC, Canada

Lecturer, School of Computer Science **Winter 2007 to Fall 2008**

- Instructor for the first offering of COMP322 (Introduction to C++) at the School of Computer Science in Fall 2007; also taught in Winter 2008 and Fall 2008 semesters (offer to teach more semesters declined due to research and family obligations).
- Co-instructor, COMP417 (Introduction to Robotics and Intelligent Systems), Winter 2007, with Professor Gregory Dudek and Philippe Giguère.

Teaching Assistant

School of Computer Science **Fall 2005 to Winter 2009**

- Teaching assistant to Professor Gregory Dudek, Winter and Fall 2005 semesters (COMP206 – Software Systems) and Winter 2007, Winter 2009 and Winter 2011 semesters (COMP765 – Mobile Robotics and Spatial Representation).
- Teaching assistant to Mr. Joseph Vybihal, Winter 2006 semester (COMP206).

Brac University, Dhaka, Bangladesh.

*Lecturer, Department of
Computer Science and Engineering.* **September 2001 to August 2003**

- Instructor and course designer, CIS110 (Programming Language I, C), Fall 2001.
- Instructor and course designer, CSE115 (Programming Language II, C++), Spring 2002.
- Instructor and course designer, CSE211 (Introduction to Algorithms), Fall 2002.
- Instructor and course designer, CSE311 (Microprocessors), Spring 2003.
- Lab Instructor, PGD101 (Post-Graduate Diploma in Computing Sciences), Spring 2002.

FREELANCE
PROJECTS

Innova Design Concepts SP Inc., Montréal, QC, Canada.

Robotics Systems Programmer. **September 2006**

- Contract Programmer for robot micro-controller and servo systems.

Constance-Lethbridge Rehabilitation Center, Montréal, QC, Canada.

Programmer. **October 2005 to April 2006**

- Programmer for the Aphasia Research Project, under supervision of lead investigator Dr. Eva Kehayia (Eva.Kehayia@mcgill.ca).

BRAC University, Dhaka, Bangladesh.

Programmer

August 2003

- Infrastructure development for the Cisco Certified Network Administrator (CCNA) course offered under the Cisco Network Academy Program.

Liberation War Museum, Dhaka, Bangladesh.

Web Developer and Systems Programmer

August 1999 - January 2000

- Development of the Liberation War Museum website, Bangladesh.

PARTICIPATION

[PR4] Represented McGill University as an “Information Ambassador” at the *Experience Canada* event during the G8/G20 summits, Toronto, ON, June 2010.

[PR3] Participated in the field trials of the NSERC AQUA Project, held at the Bellairs Research Center of McGill University, Barbados; 2005, 2006, 2007, 2008 (as Team Leader, approximately 15 participants), 2010, 2011 and 2015 (as invited research professor).

[PR2] Participated in regional ACM programming contests and the first National Computer Programming Contest (NCPC) held in Dhaka, Bangladesh, August 1998.

[PR1] Participated in the [on-line Programming contest](#) at the University of Valladolid site organized by the Association of Computing Machineries (ACM), 1998-'99.

PATENTS (GRANTED AND PENDING)

[PAT2] *Gregory Dudek, Philippe Giguère, Chris Prahacs, Shane Saunderson, Junaed Sattar, Michael Jenkin. Amphibious robotic device.* US Patent 7427220. Granted September 23, 2008.

[PAT1] *Gregory Dudek, Philippe Giguère, Chris Prahacs, Shane Saunderson, Junaed Sattar, Michael Jenkin. Amphibious robotic device (Dispotif Robotique Amphibie).* Canadian Patent Application 2555148. Patent Pending.

TECHNICAL SKILLS – SOFTWARE

Real-time and Robotic Software Systems: Real-time OS experience with QNX, including system installation and tuning on solid-state media (CompactFlash, Disk-on-Chip systems). Experience with the QNX Momentics Development Suite. RT Linux; RT Application Interface (RTAI) for Linux; Created a Linux-based quasi real-time operating environment for the Aqua amphibious robots, that serves as the operating environment for real-time machine vision algorithms. Called Vizix, this Linux image is highly optimized for the vision computing hardware on the Aqua platform.

Programming: C, C++, C#, Java, JavaScript, Pascal, PHP, Python, UNIX shell scripting, x86 Assembly, SQL, Lisp. Collaborative workflow using DVCS (Mercurial, git) and VCS (CVS, SVN) systems.

Development Tools and Environments: QtCreator, Eclipse IDE, GNU/Linux build tools (the *autotools* tool set, Emacs/Vim environments), KDevelop, CMake, Qt and GTK+ development toolkits, Microsoft Visual Studio and Visual Studio.net tool sets.

Information Technology: Networking (UDP, TCP, ARP, DNS, Dynamic routing), Service (Apache, SQL, PMWiki, POP, IMAP, SMTP, application-specific daemon design).

Parallel Programming: Message Passing Interface (MPI) version 1, OpenMP.

Computer Applications: T_EX (L^AT_EX, B_IB_TE_X, P_STricks, P_DF_Tricks), most common productivity packages (for Windows, OS X, and Linux platforms), Vim, EMacs.

MATLAB experience: linear algebra, Fourier transforms, nonlinear numerical methods, polynomials, statistics, visualization.

MATLAB toolboxes: image processing, statistics, communications, control system.

Embedded Systems: Software development in several platforms (PC104, Beagle Boards).

Operating Systems: Linux (Flavors of Ubuntu, Gentoo, RedHat/Fedora, Debian, Slackware), UNIX (AIX, HP/UNIX and several other variants), Windows 98/2000/XP/Vista/7, QNX (Up to RTOS Version 6.4).

TECHNICAL SKILLS – HARDWARE

Robotic Hardware: Hardware, operations and programming experience with the Aqua amphibious robot platforms, versions 1 and 2. Involved in the sensor systems design for the Aqua version 2 robot. <http://www.aquarobot.net>

Hardware, operations and programming experience with the Willow Garage PR2 and TurtleBot robots. Experience with PR2 maintenance and hardware modification.

Hardware, operations and programming experience with Nomadics Nomad 200 and SuperScout series of differential drive robots.

Operating Experience with Procerus Unicorn UAV test platform with the Procerus Kestrel autopilot module.

Imaging Devices: Significant experience with FireWire IIDC (Instrumentation & Industrial Digital Camera) imaging devices, including hardware installation and writing software drivers under Linux. Extensive experience writing user space and driver code for VideoForLinux (versions 1 and 2) devices.

Embedded Systems: PC104/PC104-Plus systems programming, Operating system Design and installation, system integration. Experience with the Arduino family of microcontrollers and Xbee (802.15) networking.

Localization Devices: Installation and low-level programming of various GPS devices, including but not limited to Garmin and Venus GPS receivers.

MEDIA

- [M4] NSERC Impact Story. “Swimming Robots? Six-legged Style”. http://www.nserc-crsng.gc.ca/Media-Media/ImpactStory-ArticlesPercutant_eng.asp?ID=1038.
- [M3] Participation in the Discovery Channel show “Daily Planet”, January 2008 Aqua robot field trip to Barbados. Aired February 7, 2008.
- [M2] New Scientist Online, article on the flipper-tracking for Aqua robots. <http://www.newscientist.com/blog/technology/2008/02/swimming-robot-will-follow-your-fins.html>.

- [M1] Photo credits. *Gregory Dudek and Michelle Theberge*. **Gone Swimmin'?**. IEEE Spectrum Magazine, July 2006.

SELECT SEMINARS

- [S9] Bellairs Research Institute of McGill University, Holetown, Barbados. “Multimodality and computational HRI –algorithms, interfaces and systems”. NSERC Canadian Field Robotics Network Underwater Robot Trials. January 2015.
- [S8] Clarkson University, Potsdam, NY. “ Robotics, Autonomy, Interaction and Learning – towards seamless man-machine interaction with RAIL”. Dialogues: Crossroads of Arts & Sciences, David A. Walsh Mini-Conference. November 2014.
- [S7] University of British Columbia, Vancouver, Canada. “Towards Multi-Modal Human-Machine Interaction”. Post-Doctoral Lecture Series. January 2014.
- [S6] University of British Columbia, Vancouver, Canada. “Towards Multi-Modal Human-Machine Interaction”. Post-Doctoral Lecture Series, inaugural talk. January 2013.
- [S5] University of British Columbia, Vancouver, Canada. “From the Deep Seas to Our Homes– Towards a Seamless Interface for Human-Machine Interaction”. Post-doctoral Research Day. September 2012.
- [S4] University of British Columbia, Vancouver, Canada. Robobuddies Seminar. July 2009, January and March 2012.
- [S3] Center for Intelligent Machines. McGill University, Montréal, Canada. CIM-Reparti Perception Seminars. October 2007, April 2009 and December 2010.
- [S2] BRAC University, Dhaka, Bangladesh. Advancements in Underwater Robotics and the Aqua Project. November 2006.
- [S1] Montréal-Toronto Computer Vision Workshop, Montréal, Canada. “A Visual Servoing System for an Aquatic Swimming Robot”. September 2005.

OUTREACH

- [O8] Clarkson University. Judge, First Lego League (FLL) competition. December 2014. Potsdam, NY, USA.
- [O7] University of British Columbia. “Teaching Science in the Community: Science 101”. Lectures on Robotics. June 2013 & 2014. Vancouver, Canada.
- [O6] Telus World of Science. “Opening the Door: Careers in Science”. Science mentoring for high-school seniors. October 2012. Vancouver, Canada.
- [O5] University of British Columbia. Haptics Symposium 2012, Open-house Event. Demonstration titled “A Vision-based Framework for Human-Robot Interaction”. March 2012. Vancouver, Canada.
- [O4] McGill University. Served as a judge for the final robotics project demonstrations, in the course titled ECSE-211: Design Principles and Methods.
- [O3] St-Georges High School, Montréal, Canada. Presentation on “Tele-presence across the ocean”, a demonstration of the capabilities of the Aqua robot as a real-time research and educational platform, coordinated with simulcast of live sea trials in Barbados. January 2009.

- [O2] McGill School of Computer Science Summer Camp. Keynote presenter on Robotics. July 2006.
- [O1] Coordinator for Lab Tours at the Mobile Robotics Lab, McGill University, for the “Explorations: A Panorama of Sciences” program. 2005-2011.