

# Martin Gerdzhev

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## Education

2013 – Present	<b>Ph.D. Computer Science</b> McGill University, Montreal, Canada Supervisor: Joelle Pineau
2008 – 2011	<b>M.A.Sc. Electrical and Computer Engineering</b> Ryerson University, Toronto, Canada Supervisor: Alexander Ferworn
2005 – 2008	<b>B.Sc. Computer Science with Honours</b> Ryerson University, Toronto, Canada

## Relevant Skills

**Programming Languages:** C, C++, Python, Java, Objective-C, Shell Scripting

**Vision and Robotics Libraries:** OpenCV, PCL, ROS, MoveIt!

**Machine Learning libraries:** TensorFlow, Keras

**Software Tools:** Matlab, Eagle

**Operating Systems:** Linux, Unix, Windows, OS X, Android, iOS

**Hardware:** PCB design, 3D modeling, Soldering

**Languages:** English (fluent), French (beginner), Bulgarian (native)

## Relevant Experience

2013 – Present	<b>Researcher</b> , Reasoning and Learning Lab, McGill University, Montreal <ul style="list-style-type: none"><li>• <b>Led a team of students on the SmartWheeler project</b> – a smart robotic wheelchair (<a href="http://www.cs.mcgill.ca/~smartwheeler/">http://www.cs.mcgill.ca/~smartwheeler/</a>) whose aim is to increase the autonomy and safety of individuals with severe mobility impairments.</li><li>• <b>Developed machine learning models</b> for navigation and sensor data prediction.</li><li>• <b>Developed an Arduino based control board</b> to act as an interface between the on-board computer and the wheelchair proprietary controller.</li><li>• <b>Standardized and implemented a common robot configuration and ROS code base</b> for several smart wheelchairs on the project.</li><li>• <b>Integrated the various robot sensors</b> (RGB-D cameras, lidars, gps, odometry, etc).</li><li>• <b>Developed a wireless back-up camera</b> for wheelchairs.</li></ul>
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- 2006 – 2015 | **Research Assistant/Software Developer**, Inclusive Media Design Centre, Ryerson University, Toronto
- **Led a team of developers on the Terptube project** – a Symphony based web application, that aims to create an accessible online environment that supports mentoring between Deaf users and sign language interpreters. (<https://imdc.ca/ourprojects/terptube>)
  - **Led a team of developers on the Signlink Studio project** – a Java and Flash based web authoring application that enables marginalized deaf communities who use non-text methods of communication, such as sign language, to enjoy a strong on-line presence of their culture and identity in their own language. (<http://signlinkstudio.ca>)
  - **Performed usability testing** on the above projects.
  - **Administered** two Gentoo and a RHEL server supporting several domains.
- 2010 | **Researcher - 4 month contract**, The Pressure Pipe Inspection Company, Toronto
- **Worked with a team to develop a method to easily switch from sonar to visual inspection** without the need to extract and change the sensor head of a system that transmits sensory signals across extreme distances (2KM) for pressure pipe inspection.
  - **Implemented solutions that fit within very constrained space and strict durability specifications.**
- 2008-2011 | **Research Assistant**, N-CART Lab, Ryerson University, Toronto
- **Worked with a team of researchers** on Canine Augmentation Technology (CAT) and Canine Assisted Robot Deployment (CARD) - projects focused on creating technology that facilitates the finding and rescue of live people trapped in collapsed buildings.
  - **Designed and built custom boards and robots** that could be equipped on or deployed via trained USAR dogs. (<http://ncart.scs.ryerson.ca/research/canine-augmentation-technology-cat-for-usar/>)
  - **Worked in a team to improve the Canine Remote Deployment System (CRDS)** - a dog-mounted remote delivery system for victims trapped in rubble, when human contact is precluded, but access by disaster dogs is possible.

## Professional Development

- 2016 | **Deep Learning Summer School**  
Universite de Montreal, Montreal, Canada

## Research Interests

- Machine Learning
- Deep Learning
- Robotics, Response Robotics
- Autonomous Systems and Vehicles

## Publications

### CONFERENCE PROCEEDINGS

- [1] M. Gerdzhev, J. Pineau, I. M. Mitchell, P. Viswanathan, and G. Foley, “On the use of modular software and hardware for designing wheelchair robots,” in *2016 AAAI Spring Symposium Series*, 2016.
- [2] D. I. Fels, D. Roush, P. Church, M. Gerdzhev, T. Stevens, and E. Hibbard, “Terptube: A signed language mentoring management system,” in *Computers Helping People with Special Needs*, pp. 408–414, Springer International Publishing, 2014.
- [3] J. Tran, M. Gerdzhev, and A. Ferworn, “Continuing progress in augmenting urban search and rescue dogs,” in *Proceedings of the 6th International Wireless Communications and Mobile Computing Conference*, pp. 784–788, ACM, 2010.
- [4] J. Tran, A. Ferworn, M. Gerdzhev, and D. Ostrom, “Canine assisted robot deployment for urban search and rescue,” in *Safety Security and Rescue Robotics (SSRR), 2010 IEEE International Workshop on*, pp. 1–6, IEEE, 2010.
- [5] M. Gerdzhev, J. Tran, A. Ferworn, and D. Ostrom, “Dex-a design for canine-delivered marsupial robot,” in *Safety Security and Rescue Robotics (SSRR), 2010 IEEE International Workshop on*, pp. 1–6, IEEE, 2010.
- [6] M. Gerdzhev, J. Tran, A. Ferworn, K. Barnum, and M. Dolderman, “A scrubbing technique for the automatic detection of victims in urban search and rescue video,” in *Proceedings of the 6th International Wireless Communications and Mobile Computing Conference*, pp. 779–783, ACM, 2010.
- [7] D. I. Fels, M. Gerdzhev, J. Ho, and E. Hibbard, “Usability and use of sls: caption,” in *Proceedings of the 12th international ACM SIGACCESS conference on Computers and accessibility*, pp. 291–292, ACM, 2010.
- [8] D. I. Fels, M. Gerdzhev, E. Hibbard, A. Goodrum, J. Richards, J. Hardman, and N. Thompson, “Sign language online with signlink studio 2.0,” in *Universal Access in Human-Computer Interaction. Applications and Services*, pp. 492–501, Springer Berlin Heidelberg, 2009.
- [9] M. Bashardoust, M. Gerdzhev, and A. Abhari, “Peer-to-peer simulation for improving the system of serving multimedia on the web,” in *Proceedings of the 2009 Spring Simulation Multiconference*, p. 125, Society for Computer Simulation International, 2009.

### THESIS

- [1] M. Gerdzhev, “An enhanced system for augmenting urban search and rescue canines,” 2011.