

# Martin Gerdzhev

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## Education

2013 – Present	<b>Ph.D. Computer Science</b> McGill University, Montreal, Canada Supervisor: Joelle Pineau, David Meger
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, Javascript, PHP

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

**Machine Learning Libraries:** TensorFlow, Pytorch, Keras, TensorRT

**Other Libraries and Tools:** Matlab, Pandas, Numpy, Scikit-learn, Seaborn, DeepStream, GStreamer

**Version Control:** Git, SVN

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

## Relevant Experience

2020 – Present	<b>Computer Vision Engineer</b> , Curbflow Inc, San Francisco (Remote) <ul style="list-style-type: none"><li>• <b>Developed Computer Vision solutions</b> for curb-side and indoors analytics</li><li>• <b>Optimized and Deployed deep learning models</b> on edge hardware.</li><li>• <b>Worked with a team to develop the detection and streaming software</b> for the edge devices</li></ul>
2018 – 2020	<b>Machine Learning Research Engineer</b> , Huawei Technologies Canada, Markham <ul style="list-style-type: none"><li>• <b>Developed machine learning solutions for perception of self-driving cars</b></li><li>• <b>Worked with a team to develop machine learning models</b> for 3D object detection using Lidar.</li><li>• <b>Conducted research and prepared articles for publication</b></li></ul>

- 2013 – 2018 **Researcher**, Reasoning and Learning Lab, McGill University, Montreal
- **Led a team of students on the SmartWheeler project** – a smart robotic wheelchair (<http://www.cs.mcgill.ca/~smartwheeler/>) whose aim is to increase the autonomy and safety of individuals with severe mobility impairments.
  - **Developed machine learning models** for navigation and sensor data prediction.
  - **Developed an Arduino based control board** to act as an interface between the on-board computer and the wheelchair proprietary controller.
  - **Standardized and implemented a common robot configuration and ROS code base** for several smart wheelchairs on the project.
  - **Integrated the various robot sensors** (RGB-D cameras, lidars, gps, odometry, etc).
  - **Developed a wireless back-up camera** for wheelchairs.
- 2017 – 2018 **College Instructor**, Computer Science Department, Dawson College, Montreal
- **Taught several courses** including Java, Linux and Operating Systems, as well as Website creation
- 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.
- 2011 – 2013 **University Instructor**, Chang School of Continuing Education, Ryerson University, Toronto
- **Taught a variety of courses** including Network Administration for Linux, Android Apps Development, Flash, and Advanced Java Web Development
- 2010 – 2013 **College Instructor**, Faculty of Applied Science and Technology, Sheridan College, Brampton and Oakville
- **Taught a variety of courses** ranging from Java, Linux, Operating Systems, iPhone Apps Development, and web Development.

2010	<p><b>Researcher - 4 month contract</b>, The Pressure Pipe Inspection Company, Toronto</p> <ul style="list-style-type: none"> <li>• <b>Worked with a team to develop a method to easily switch from sonar to visual inspection</b> 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.</li> <li>• <b>Implemented solutions that fit within very constrained space and strict durability specifications.</b></li> </ul>
2008 – 2011	<p><b>Research Assistant</b>, N-CART Lab, Ryerson University, Toronto</p> <ul style="list-style-type: none"> <li>• <b>Worked with a team of researchers</b> 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.</li> <li>• <b>Designed and built custom boards and robots</b> that could be equipped on or deployed via trained USAR dogs. (<a href="http://ncart.scs.ryerson.ca/research/canine-augmentation-technology-cat-for-usar/">http://ncart.scs.ryerson.ca/research/canine-augmentation-technology-cat-for-usar/</a>)</li> <li>• <b>Worked in a team to improve the Canine Remote Deployment System (CRDS)</b> - a dog-mounted remote delivery system for victims trapped in rubble, when human contact is precluded, but access by disaster dogs is possible.</li> </ul>

## Professional Development

2016	<p><b>Deep Learning Summer School</b> Universite de Montreal, Montreal, Canada</p>
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## Research Interests

- Machine Learning
- Deep Learning
- Robotics
- Autonomous Systems and Vehicles
- Computer Vision

## Publications

### CONFERENCE PROCEEDINGS

- [1] M. Gerdzhev, R. Razani, E. Taghavi, and B. Liu, “Tornado-net: multiview total variation semantic segmentation with diamond inception module,” in *2021 IEEE International Conference on Robotics and Automation*, 2021.
- [2] E. R. Corral-Soto, A. Nabatchian, M. Gerdzhev, and L. Bingbing, “Lidar few-shot domain adaptation via integrated cyclegan and 3d object detector with joint learning delay,” in *2021 IEEE International Conference on Robotics and Automation*, 2021.
- [3] 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.

- [4] 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.
- [5] 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.
- [6] 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.
- [7] 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.
- [8] 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.
- [9] 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.
- [10] 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.
- [11] 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.