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# Hamidreza Saghir

**Ph.D. Candidate, University of Toronto**

## HIGHLIGHTS

- Won the **Ontario Trillium Scholarship** with a value of **160k CAD** for Ph.D. study (only 15 of this scholarship available at UofT).
- **Co-Founded Recreate Robotics**, a company focused on **Machine Vision and robotics** for entertainment and sports, **gathered a team**, developed a **product**, and sold to **customers**.
- **Research** experience in **Machine Learning** and **Robotics**.
- Been awarded the **Connaught International Scholarship** at UofT.


### Online

- Blog: https://hsaghir.github.io/
- Linkedin: linkedin.com/in/hamidrezasaghir
- Github: https://github.com/hsaghir

### Contact

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## EDUCATION

- **Ph.D. candidate in Biomedical Engineering (2013-2017)**
  The university of Toronto, Toronto, Canada
- **M.Sc. in Mechatronics (2008-2011)**
  Sharif University of Technology, Tehran, Iran
- **B.Sc. in Mechanical Engineering (2004-2008)**
  The Ferdowsi University of Mashhad, Mashhad, Iran

## TECHNICAL EXPERIENCES

**Machine Learning:**

- Deep Neural Networks (CNNs, RNNs, Autoencoders)
- Deep generative models (VAE, GAN, RBM, DAE)
- General ML concepts: models, regularization, optimization, Bayesian Statistics

Analytical skills:

- Math and Algorithms
- Experimental design

Coding:

- Python , Pytorch, Keras
- MATLAB
- Bash, git

## PROFESSIONAL EXPERIENCES

- **Machine Learning Researcher,** RBC research Institute, May 2017 – present
  - Working on classification, anomaly detection, semi-supervised learning, and missing value imputation
- **Co-Founder & CEO,** Recreate Robotics, Toronto, Canada, April 2014 – Sep 2016.
  - Started the venture, gathered a team, and made a prototype leading to full product and sales.
- **Researcher,** Holland Bloorview kids rehabilitation hospital, Toronto, Canada, Sep 2013 – present.
  - Performed research on nonlinear dynamics of biological time series leading to publications.
- **Research Intern**, Italian Institute of Technology (IIT), Genova, Italy, Jan-Sep 2013.
  - Performed control and planning of legged locomotion for HyQ quadruped robot leading to more agile movements for the robot.
- **Part-time Lecturer**, Parseh Institute of Higher Education**,** Shiraz, Iran, Fall 2012.
  - Teaching Robotics to 3rd-year Undergraduate students in Mechanical Engineering.
- **R&D manager**, Alpex Pipe, Fittings and Radiant Heating Company, Shiraz, Iran, Spring 2010 to Fall 2012.
  - Head of Research and Engineering department. Led a team of three people and hired outsource resources to the successful introduction of a new line of products to the market.

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## PROJECTS HIGHLIGHTS

- **Model-based Missing value imputation (RBC research - ongoing):** Using deep generative models to impute missing values in a very sparse real-world dataset in order to be able to improve the performance on the follow on task (i.e. classification and anomaly detection)
- **Semi-supervised Learning (RBC research):** Used deep generative models based on autoencoding variational Bayes framework to do semi-supervised learning in an applied problem with a small subset of labeled data and a large unlabeled dataset leading to improved classification performance.
- **Nonlinear dynamics of biological time series (Ph.D. project),** developed a framework for analysis of complex dynamics in biological time series by characterizing, clustering and classifying scaling dynamics. We further inspect the underlying dynamics of physiological processes through analysis of generative neural network models. The code is written in MATLAB and Python.
- **Reinforcement-learning-based control using on emotions (M.Sc. Thesis)**, developed an intelligent controller that learned to control complex nonlinear dynamical systems (e.g. cart-pole, ball & beam) from scratch using a variant of reinforcement learning combined with a neuro-fuzzy artificial neural network. Inspirations were derived from emotional processing mechanism in the brain. The code and simulations were written in MATLAB.
- **Planning and control of Legged Locomotion (Internship),** developed and coded the optimum path for agile motion of HyQ quadruped robot developed at the Italian institute of technology. The code was written in C++.
- **Parallel Robotics (Course project)**, 3-RPS and 3-RPU parallel mechanisms were simulated in MATLAB and inverse kinematic, dynamics and control of the platforms were solved and coded.
- **Dynamics and Control (Course project)**, dynamic Modeling, Control and Simulation of a Quad-rotor UAV system. Code written in MATLAB.

## ENTREPRENEURIAL ACTIVITIES

- Co-Founded **Recreate Robotics**, a company specialized in computer vision for sports and entertainment. Our flagship product RoboGoalie, a robotic goalie for soccer and hockey, used machine vision to track the trajectory of the ball in real-time and stop the ball from entering the goal.
- Participated in multiple Startup Weekend, pitch competitions and Hackathons.
- Served as a consultant, **Startup Consulting** program in association with **McKinsey & Company**, University of Toronto Consulting Association (UTCA), 2015-2016.
- Attended Entrepreneurship 101, MaRS's flagship weekly lecture series, Toronto.
- Attended multiple University of Toronto Volunteer Consulting Group (UTCA VCG) and Institute for Leadership Education in Engineering (ILead) workshops.