

Alexandru Litoiu

Date of Birth
March 15, 1990

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EDUCATION	◇ Yale University New Haven, CT	2015
	<i>MPhil in Computer Science - Social Robotics Lab</i>	
	◇ Yale University New Haven, CT	2015
	<i>MSc in Computer Science - Social Robotics Lab</i>	
	<i>First in Class - Perfect Grades</i>	
	◇ University of Toronto Toronto, ON	2012
	<i>BASc. in Computer Engineering, Honours</i>	
	<i>Major: Software Engineering</i>	
	<i>Capstone Project: "Twitter Stock Market Prediction"</i>	
	◇ Upper Canada College Toronto, ON	2008
	<i>International Baccalaureate High School Diploma</i>	
AWARDS	◇ 2015 - Yale Carle Fellow	-
	◇ 2015 - HRI Pioneers Grant	1,275
	<i>10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015)</i>	
	◇ 2013 - Young Scientist and Entrepreneur Award	-
	<i>Observatorul - International Romanian Magazine</i>	
	◇ 2012 to 2018 - Yale University Fellowship	64,950/year
	◇ 2012 - Outstanding Design Project of the Year	-
	<i>University of Toronto Electrical and Computer Engineering</i>	
	◇ 2012 - NSERC Post Graduate Scholarship	17,300
	◇ 2012 - Alexander Graham Bell Canada Graduate Scholarship	17,500
	<i>Turned down</i>	
	◇ 2011 - The Next 36 Entrepreneurial Leaders of Canada	25,000
	◇ 2011 - Stavros Leventis Memorial Award	305
	<i>University of Toronto Electrical and Computer Engineering</i>	
	◇ 2011 - NSERC Undergraduate Student Research Award	4,500
	◇ 2010 - NSERC Undergraduate Student Research Award	4,500
	◇ 2008 - Ontario Scholar	-
	◇ 2008 - University of Toronto Scholar	5,000
	◇ 2008 - Senior Mann Prize for Best Extended Essay	-
	<i>For the best International Baccalaureate Extended Essay at Upper Canada College, in a class of 150</i>	

- RESEARCH EXPERIENCE
- ◇ **Yale University** Research Assistant 2012 -
Social Robotics Lab - Professor Brian Scassellati
 Studied the effects of the presence of robot tutors on teaching young children as part of a \$10 million multi-institutional NSF Expedition in Computing, led by the Social Robotics Lab at Yale. Studied the effects of robots emulating human mannerisms, as well as user-modeling algorithms to personalize advice to the individual.
 - **Shaping Productive Help-Seeking Behavior In Tutoring Interactions**
 Can a social robot increase a child's learning gains in a math tutoring interaction by discouraging misuse of help-seeking behaviors? I co-designed and supervised a study (29 child participants, 4 sessions each) in which a tutoring robot adaptively discouraged overuse and aversion of help-seeking behaviors to encourage active learning in the experimental group. Participants in the experimental group reduced their sub-optimal behaviors over time significantly more than the control group, as well as improved their scores from pre-test to post-test significantly more than the control group. *HRI, 2016 (Best paper award nomination for "Studies of HRI")*
 - **Personalized Instruction of Physical Skills with a Social Robot**
 How do we deliver advice to effectively induce a transformation from incorrect human movements into correct human movements? I lead a project to design a robot to watch students to perform a physical skill, diagnose the problems in the motion, prioritize the most important problem, and communicate improvements in the form of verbal advice and physical demonstrations. *MLIS, 2014; HRI Pioneers, 2015*
 - *Perception:* Kinect Sensor
 - *Diagnosis of Problems:* Dynamic time warping, signal shifting, discretization and subtraction of signals
 - *Prioritization:* Train SVM model on feature vector of problems, and supervisory signal of binary success or failure. Prioritize problem as highest weighted feature
 - *Communication:* Nao robot performs physical demonstrations on how to improve motion
 - *Technologies Used:* Kinect, Nao robot, naoqi, Python, scikit-learn
 - **Manipulating Perceptions of Robot Agency**
 Was principal investigator in an 80-participant study to analyze human perceptions and behavior resulting from cheating scenarios to better understand how apparent agency affects human-robot interactions. Designed robot software and supervised study to determine what attributions humans make towards a cheating robot in the context of a game, when the robot cheats to beat, lose to, or tie the participant throughout the interaction. *HRI, 2015*
 - **DragonBot Nutrition Tutor**
 Studied robot engagement in an extended, 6-session study with a group of 26 first-grade children and a DragonBot social robot in the context of learning about healthy food choices. Found a statistically significant increase in engagement with the system over the duration of the interaction, as measured by child verbal response times. *ROMAN, 2014*
 - ◇ **University of Toronto** Senior Design Project 2011
"Twitter Stock Market Prediction" - Professor Brendan Frey
 Thesis project using machine learning methods attempting to predict the NASDAQ based on sentiment analysis of Twitter data comprised of 200 million tweets. We have achieved a 60% prediction rate for directional changes of index funds one day in advance.
 - Outstanding Design Project of the Year in University of Toronto Electrical and Computer Engineering
 - ◇ **University of Toronto** Summer Undergraduate Research Position 2011

iQua Research Group - Professor Baochun Li

As an NSERC Undergraduate Student Research Award Recipient, I worked on developing a novel peer-to-peer group video conferencing learning algorithm, which adapts parameters in the conference based on network conditions.

- ◇ **University of Toronto** Summer Undergraduate Research Position 2010
Middleware Software Research Group - Professor Hans-Arno Jacobsen
Worked on benchmarking, speeding up and improving the Publish/Subscribe Applied to Distributed Resource Scheduling (PADRES) project as an NSERC Undergraduate Student Research Award Recipient.

TEACHING
EXPERIENCE
AND
MENTORSHIP

- ◇ **Yale University** Teaching Fellow Jan. 2015 - May 2015
CPSC 472 Intelligent Robotics - Brian Scassellati
Created Problem Sets, grading schemes, and graded a class of 70 undergraduates. Held weekly office hours, review sessions, and met with students individually.
- ◇ **Yale University** Teaching Fellow Sept. 2013 - Dec. 2013
CPSC 472 Intelligent Robotics - Brian Scassellati
Created Problem Sets, grading schemes, and graded a class of 70 undergraduates. Held weekly office hours, review sessions, and met with students individually.
- ◇ **Yale University** Social Robotics Lab 2012 - 2014
Mentored 17 undergraduate students on 9 separate projects.

INDUSTRY
EXPERIENCE

- ◇ **Facebook** Software Engineer Aug. 2015 -
Menlo Park, CA
- ◇ **Atlus** Co-Founder, CTO, and Lead Backend Developer 2012 - 2013
Toronto, ON
Atlus was acquired by Purple Forge in 2013. Atlus was a mobile location recommendation platform which enabled users to build their own exclusive network of restaurant recommendations with their friends. The company was founded in 2012 by Alex Litoiu, Evan Williams, and Mike Murchison and received investment from The Next 36.
 - Architected and built scalable backend server for live, production social media location recommendation application
 - Built initial iOS application prototype
 - Recruited and led technical team of 6 people, of Atlus's 10 employees
 - Initiated, led, negotiated, and closed company sale to PurpleForge in 2013
 - *Backend Technologies:* Python, Apache, Django, Amazon EC2, Ubuntu 12.04, haproxy, PostgreSQL, postGIS
- ◇ **IBM** Software Engineering Intern 2006 - 2010
Toronto, ON - IBM Centre for Advanced Studies
Led and participated in educational initiatives to increase interest in Computer Science in Canadian high schools. Developed educational resources used by students from across Canada. Helped organize the CASCON High School Programming Competition, a Canada-wide programming competition.
 - Developed educational resources used by hundreds of students
 - Virtual Classroom Modules: educational resources that mirror the Ontario curriculum
 - PiggySandbox, an educational Java game engine
 - Java Applet & Java ME programming quiz applications
 - Programming tutorials and problems
 - Helped organize the CASCON High School Programming Competition, which attracts 50 students annually

- PERSONAL PROJECTS
- ◇ **Golf Swing Action Recognition** iPhone Mobile Application 2014
 Conceived, designed and implemented an in-pocket mobile classifier to detect when the user has performed a golf swing based on accelerometer readings. Records location of all swings, to enable playback of a round, including distances, and shot placement. Requires no manual input, unlike comparable products on the market.
 - Features include: Cross-platform event-based C++ code that runs on iPhone and Android, robust signal processing and feature extraction, machine learning data pipeline
 - *Technologies Used:* C++, Boost Asio, dlib Machine Learning Library, Bash and Python Machine Learning Pipeline, dygraph Javascript visualization library, Git
 - ◇ **ProTrack** iPhone Mobile Application 2013
 Conceived, designed and implemented a computer vision algorithm to detect and track golf balls flying downrange up to approximately 50 yards from an iPhone 5 video recording. Reprojected from 2-dimensional video into 3-dimensions, and extrapolated trajectory using Newtonian mechanics and Magnus effect. Achieved performance of 8% average error in tracking ball flight distance compared with gold standard on a sample of swings averaging 150 yards.
 - Funded by Yale Entrepreneurship Institute Venture Creation Program
 - *Technologies Used:* C++, Python, OpenCV, CMake, Git
 - ◇ **Habit Droid** Android Mobile Application 2010
 Conceived, designed and implemented a habit-forming application that has helped over 10,000 individuals improve their discipline.
 - Features include: Habit reminders, habit tracking, and graphing
 - *Technologies Used:* Java, Javascript, Flot, JSON, Android Eclipse SDK, SQLite, SVN
 - ◇ **RomaniaOptimista.com** Ruby on Rails Application 2009
 Developed a question/answer web application focused on resolving social problems in the Romanian community. This fully featured collaborative problem-solving website allowed users to work together to take a problem all the way through from the ideation stage, to a clear definition, to finding solutions, to executing them.
 - *Features:* Personal profiles, internal mailing, commenting, internationalization, full search
 - *Technologies Used:* Ruby on Rails, Prototype Javascript library, Ajax, Textile, Sphinx, I18n, MySQL
- COURSE PROJECTS
- ◇ **Intelligent Robotics** 2013
 Studied the effects on credibility of a robot's acknowledgement of mistakes in a game-playing interaction. Found an interaction effect, in that competent robots are more trustworthy when acknowledging mistakes, whereas incompetent robots are less trustworthy when acknowledging mistakes.
 - *Technologies Used:* DragonBot robot platform, Java, Java Swing, TCP Sockets
 - Perfect Grade
 - ◇ **Communication and Design** 2010
 Led a group of three to implement a multi-threaded C-based storage server and accompanying client libraries.
 - *Technologies Used:* C, Lex/Yacc, Pthreads, C non-blocking sockets, C Unit Test, SVN, Oxygen
 - Achieved a grade of 91 (A+)

- ◇ **Computer Organization**
2010
- Designed a Wii Nunchuk (I2C accelerometer device) car. Created a custom FPGA soft processor with an attached I2C module. Programmed the soft processor to interface with the Nunchuk accelerometers in assembly language.
- *Technologies Used:* Quartus, Verilog, C, Assembly Language, Hardware interrupts, Altera DE2 Board, I2C Protocol
 - Achieved a grade of 93 (A+)

- ◇ **Digital Systems**
2009
- Designed and implemented the classic game “Breakout” in hardware on a Field Programmable Gate Array. Made extensive use of Finite State Machines. Interfaced with a VGA monitor and keyboard.
- *Technologies Used:* Quartus, Verilog, Altera DE2 Board, Hardware VGA driver, PS/2 keyboard protocol
 - Achieved a grade of 92 (A+)

- FUNDRAISING
◇ **2014 - Yale Entrepreneurship Institute Grant**
2,500
- ◇ **2012 - Atlas Seed Funding**
40,000
- ◇ **2007 - Upper Canada College, College Times Yearbook**
15,000

- LEADERSHIP
◇ **Atlas** Co-founder, Chief Technical Officer
2012 - 2013
- Led technical team of company with 10 employees
- ◇ **The Next 36** One of “The Next 36 entrepreneurial leaders of Canada”
2012
- Runner up for the Satchu prize for most likely to make the largest impact in the next 20 years.
- ◇ **University of Toronto Romanian Students Club** Executive
2008 - 2010

- REFEREED PAPERS
◇ Aditi Ramachandran, **Alexandru Litoiu**, Brian Scassellati. 2016. Shaping Productive Help-Seeking Behavior During Robot-Child Tutoring Interactions. To Appear: In Proceedings of the 11th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2016). Christchurch, New Zealand, March 7-10.
- 25% acceptance rate.
 - Best paper award nomination for “Studies of HRI.”
- ◇ **Alexandru Litoiu**, Daniel Ullman, Jason Kim, Brian Scassellati. 2015. Evidence that Robots Trigger a Cheating Detector in Humans. In Proceedings of the 10th ACM/IEEE International Conference on Human-Robot Interaction. Portland, Oregon, USA, March 2-5.
- 25% acceptance rate.
 - Reading material for Yale Introduction to Cognitive Science (CGSC 110 / PSYC 130).
- ◇ **Alexandru Litoiu**, Brian Scassellati. 2015. Robotic Coaching of Complex Physical Skills. In Proceedings of the HRI Pioneers Workshop at the 10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015). Portland, Oregon, USA, March 2.
- ◇ Bradley Hayes, Elena Corina Grigore, **Alexandru Litoiu**, Aditi Ramachandran, Brian Scassellati. 2014. A Developmentally Inspired Transfer Learning Approach for Skill Proficiency Assessment. In 4th International Conference on Development and Learning and on Epigenetic Robotics (ICDL 2014). IEEE, Genoa, Italy, October 13-16

- ◇ **Alexandru Litoiu**, Brian Scassellati. 2014. Personalized Instruction of Physical Skills with a Social Robot. In Proceedings of the 3rd Workshop on Machine Learning for Interactive Systems: Bridging the Gap between Perception, Action and Communication (MLIS '14) in Workshops at the Twenty-Eighth AAAI Conference on Artificial Intelligence. ACM, Quebec City, QC, Canada, July 28
 - ◇ Elaine Short, Kathleen Swift-Spong, Jillian Greczek, Aditi Ramachandran, **Alexandru Litoiu**, Elena Corina Grigore, David Feil-Seifer, Samuel Shuster, Jin Joo Lee, Sahib Huang, Svetlana Levonisova, Sarah Litz, Jamy Li, Gisele Ragusa, Donna Spruijt-Metz, Maja Matrix, Brian Scassellati. 2014. How to Train Your DragonBot: Socially Assistive Robots for Teaching Children About Nutrition Through Play. In Robot and Human Interactive Communication, 2014 (ROMAN 2014). IEEE, Edinburgh, United Kingdom, August 25-29
- TALKS
- ◇ Evidence that Robots Trigger a Cheating Detector in Humans. 10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015). Portland, Oregon, March 4
 - ◇ Personalized Instruction of Physical Skills with a Social Robot. Machine Learning for Interactive Systems Workshop at AAAI 2014. Quebec City, Canada, July 28
- POSTERS
- ◇ Evidence that Robots Trigger a Cheating Detector in Humans. 10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015). Portland, Oregon, March 4
 - ◇ Robotic Coaching of Complex Physical Tasks. HRI Pioneers Workshop at the 10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015). Portland, Oregon, March 2
 - ◇ Cheating Robots: Manipulating Perceptions of Robot Agency. “Robotics Exhibition” at CogSci/AAAI 2014. Quebec City, Canada, July 26-30
- REVIEWING
- ◇ **ACM/IEEE International Conference on Human-Robot Interaction (HRI)** 2015, 2016
 - ◇ **IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)** 2014, 2015
 - ◇ **AAAC International Conference on Affective Computing and Intelligent Interaction (ACII)** 2015
 - ◇ **International Conference on Social Robotics (ICSR)** 2015
 - ◇ **The Next 36 - Canada’s Entrepreneurial Leadership Institute - Admissions** 2015, 2016
- PROGRAMMING LANGUAGES
- ◇ **Programming Languages**
 - *Best*: Python, C, Java, Haskell, Javascript, C++, Bash
 - *Proficient in*: Hack (PHP), Clojure, Verilog, Ruby, SQL, HTML, CSS3, Octave, R, Matlab
 - *Familiar with*: Objective C, Scheme, PHP, Visual Basic, awk, sed, Assembly, Lex/Yacc, JAGS
 - ◇ **Programming Paradigms and Tools**

- *Operating Systems:* Ubuntu Linux, Microsoft Windows XP/2000/7, Mac OS X
- *Paradigms:* Server/Client, Web Applications, Mobile Applications, Object Oriented, Multi-Threaded, Event-Driven, Cloud Computing
- *Web Development:* Django, Ruby on Rails, Jekyll, REST, Javascript, jQuery, HTML, CSS3, PostgreSQL, MongoDB, MySQL, SQLite, Hack, PHP, XHP, hax-proxy, Amazon EC2
- *Development Environments:* Vim, Xcode, Eclipse, Sublime Text 2
- *Databases:* Apache Hive, PostgreSQL, MongoDB, MySQL, SQLite
- *Versioning Systems:* Git, SVN, CVS, Mercurial
- *Statistical Analysis:* SPSS, R, Matlab, Octave, JAGS, scikit-learn, dlib
- *Advanced Libraries:* Qt, OpenCV, Boost, dlib, scikit-learn
- *Robots:* Aldebaran Nao, MIT DragonBot
- *Media Processing:* Photoshop, GIMP, iMovie
- *Office:* Word, Excel, PowerPoint, Outlook, iWork, Open Office, LibreOffice

COURSES
TAKEN

◇ **Yale University**

- PHIL 627 Computability and Logic
- PSYC 110 Introduction to Psychology
- PSYC 150 Social Psychology
- STAT 548 Probability and Statistics
- CPSC 573 Intelligent Robotics
- CPSC 567 Cryptography and Computer Security
- CPSC 537 Introduction to Databases
- CPSC 752 Bioinformatics: Practical Applications of Simulation and Data Mining
- CPSC 570 Artificial Intelligence
- CPSC 526 Building Decentralized Systems

◇ **University of Toronto**

- ECE 521 Inference Algorithms
- MIE 331 Physiological Control Systems
- ECE 472 Engineering Economic Analysis and Entrepreneurship
- APS 202 Technology in Society and the Biosphere II
- APS 201 Technology in Society and the Biosphere I
- CSC 326 Programming Languages
- CSC 444 Software Engineering I
- ECE 454 Computer Systems Programming
- CIV 488 Entrepreneurship and Business for Engineers
- CSC 343 Introduction to Databases
- ECE 334 Digital Electronics
- ECE 342 Computer Hardware
- ECE 344 Operating Systems
- SOC 103 Social Institutions
- ECE 361 Computer Networks I
- ECE 345 Algorithms and Data Structures
- ECE 316 Communication Systems
- ECE 302 Probability and Random Processes
- ECE 297 Communication and Design
- ECE 243 Computer Organization
- ECE 231 Intro to Electronics
- ECE 221 Electric and Magnetic Fields II
- ECE 216 Signals and Systems
- MAT 291 Calculus III
- MAT 290 Advanced Engineering Mathematics

- ECE 244 Programming Fundamentals
- ECE 241 Digital Systems
- ECE 212 Circuit Analysis
- MAT 195 Calculus II
- MAT 185 Linear Algebra
- ESC 102 Praxis II
- ECE 159 Fundamentals of Electric Circuits
- CSC 190 Computer Algorithms and Data Structures
- BME 105 Systems Biology
- PHY 190 Relativity
- PHY 180 Classical Mechanics
- MAT 194 Calculus 1
- MAT 190 Matrix and Vector Algebra
- ESC 101 Praxis I
- CSC 180 Introduction to Computer Programming
- CIV 102 Structures and Materials

◇ **The Next 36 (University of Toronto)**

- Strategy Identification and Evaluation Prof. Pai-Ling Yin, Stanford
- Entrepren. Strat. in Tech. Markets Prof. David Hsu, Wharton
- Creating New Ventures Prof. Stewart Thornhill, Michigan
- Digital Strategy Prof. Joshua Gans, Toronto
- Economics of Entrepreneurship Reza Satchu, CEO, Alignvest
- Getting it Done Prof. Calder & Prof. O'Dwyer, Toronto
- Valuation Workshop John Kelleher, Partner, McKinsey
- Market Research Prof. Avi Goldfarb, Toronto
- Strategy and Innovation Prof. Ajay Agrawal, Toronto

◇ **Online**

- Machine Learning - Andrew Ng - Stanford - Coursera (96.9%)
- Introduction to Radar Systems - Robert M. O'Donnell - MIT Lincoln Laboratory

TEST SCORES ◇ **SAT**

- Math: 800 - Writing: 750 - Reading: 740
- Physics: 800 - Math II: 790 - French: 770

PROFESSIONAL ◇ **Yale Toastmasters** Member 2013 - 2015
ACTIVITIES

◇ **Robotics Outreach** 2012 - 2015
Educational outreach to expose Connecticut and New York elementary school children to robots from the Yale Social Robotics lab at open houses, local schools, and public events.

INTERESTS AND ◇ **Soccer, Tennis and Rowing**
OTHER Won five national and provincial championships in soccer and tennis.
Competed at the national level in rowing. Captained multiple teams.

◇ **Photography**

◇ **Languages**
Fluent in English, Romanian, and French.