Alexandru Litoiu

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EDUCATION	◇ **Yale University** New Haven, CT	2015
	MPhil in Computer Science - Social Robotics Lab	
	◇ **Yale University** New Haven, CT	2015
	MSc in Computer Science - Social Robotics Lab	
	First in Class - Perfect Grades	
	◇ **University of Toronto** Toronto, ON	2012
	BASc. in Computer Engineering, Honours	
	Major: Software Engineering	
	Capstone Project: "Twitter Stock Market Prediction"	
	◇ **Upper Canada College** Toronto, ON	2008
	International Baccalaureate High School Diploma	

AWARDS	◇ **2015 - Yale Carle Fellow**	-
	◇ **2015 - HRI Pioneers Grant**	1,275
	10th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2015)	
	◇ **2013 - Young Scientist and Entrepreneur Award**	-
	Observatorul - International Romanian Magazine	
	◇ **2012 to 2018 - Yale University Fellowship**	64,950/year
	◇ **2012 - Outstanding Design Project of the Year**	-
	University of Toronto Electrical and Computer Engineering	
	◇ **2012 - NSERC Post Graduate Scholarship**	17,300
	◇ **2012 - Alexander Graham Bell Canada Graduate Scholarship**	17,500
	Turned down	
	◇ **2011 - The Next 36** Entrepreneurial Leaders of Canada	25,000
	◇ **2011 - Stavros Leventis Memorial Award**	305
	University of Toronto Electrical and Computer Engineering	
	◇ **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**	-
	For the best International Baccalaureate Extended Essay at Upper Canada College, in a class of 150	

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 signitifcantly 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 led 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   2012 - 2013
Toronto, ON
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. *Atlus was acquired by Purple Forge in 2013.*

· 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 - Atlus Seed Funding** 40,000
◇ **2007 - Upper Canada College, College Times Yearbook** 15,000

LEADERSHIP

◇ **Atlus** 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. 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, haxproxy, Amazon EC2

- *Development Environments:* Vim, Xcode, Eclipse, Sublime Text 2
- *Databases:* Apache Hive, Presto, 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
- · 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.