

Nathan David Green

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Citizenship United States of America

Research Specialty Natural Language Processing, Artificial Intelligence, Machine Learning, Serious Games, Corpus Linguistics, Human Computer Interaction, Collaborative Environments, Sensor Networks, and Under-Resourced Languages

Education

Charles University, Prague, Czech Republic
Ph.D., Computational Linguistics, 2010 - Present

- Adviser: Zdenek Zabokrtsky, Ph.D.
- The Institute of Formal and Applied Linguistics

North Carolina State University, Raleigh, NC USA
Graduate Work, Computer Science, 2007 - 2010

- Adviser: Nagiza Samatova, Ph.D.
- Research Area: *Breaking the Bottleneck of Training Data Creation in Machine Learning using Social Networks Combined with Collaborative Conflict Resolution*

University of Iceland (Hàskòli Íslands), Reykjavik, Iceland
Icelandic Language Classes, 2006 - 2007

The George Washington University, Washington, DC USA
M.S., Computer Science, 2003 - 2006

North Carolina State University, Raleigh, NC USA
B.S., Computer Science, 1999 - 2003

- Minor: Mathematics.

Awards

Marie Curie Early Stage Researcher

- Czech Republic, 2010 - 2013.
- Researching dependency parsing and unsupervised machine learning techniques.

Fulbright Fellowship

- Iceland, 2006 - 2007.
- Researched Icelandic language in modern human language technology.

Research Grant, North Carolina State University

- 2008 - 2009 (\$26,847)
- 2007 - 2008 (\$26,386)

Teaching Grant, North Carolina State University

- 2009 - 2010 (\$22,341)

Outstanding Graduate Teaching Assistant Award, 2010

Upsilon Pi Epsilon

- International Honor Society for the Computing and Information Disciplines

IEEE Computer Society International Design Competition (CSIDC) World Finalist

- CSIDC 2003 theme *Added Value: Turning Computers Into Systems*
- 3rd Place, the highest finish of any U.S. team at that time

Publications

Nathan Green and Zdeněk Žabokrtský, *Hybrid Combination of Constituency and Dependency Trees into an Ensemble Dependency Parser*, Proceedings of Innovative hybrid approaches to the processing of textual data, workshop in the 13th Conference of the European Chapter of the Association for computational Linguistics (EACL), Avignon, France, 2012

Nathan Green, *Building Parallel Corpora through Social Network Gaming*, Proceedings of Collaborative Resource Development and Delivery, Workshop in The Eighth International Conference on Language Resources and Evaluation (LREC), Istanbul, Turkey, 2012

Nathan Green, *Dependency Parsing*, WDS11 Proceedings of Contributed Papers, Prague, Czech Republic, pp. 137-142, 2011

Popel, Martin and Mareček, David and **Green, Nathan** and Žabokrtský, Zdeněk, *Influence of Parser Choice on Dependency-Based MT*, Proceedings of the Sixth Workshop on Statistical Machine Translation, Edinburgh, Scotland, pp. 433-439, 2011

Nathan Green, *Effects of Noun Phrase Bracketing in Dependency Parsing and Machine Translation*, Association for Computational Linguistics (ACL) Student Session, Portland, Oregon, 2011

N. Green, P. Breimyer, V. Kumar, and N.F. Samatova, *PackPlay: Mining semantic data in collaborative games*, Linguistics Annotation Workshop (LAWIV), Uppsala, Sweden, 2010

N. Green, P. Breimyer, V. Kumar, and N.F. Samatova, *WebBANC: Building Semantically-Rich Annotated Corpora from Web User Annotations of Minority Languages*, 17th Nordic Conference on Computational Linguistics, Odense, Denmark, Vol. 4, pp. 48-56, 2009

N. Green, P. Breimyer, V. Kumar, and N.F. Samatova, *BioDEAL: Community Generation of Biological Annotations*, BMC Medical Informatics and Decision Making, Vol. 9 Suppl 1., 2009 (Invited)

P. Brent, **N. Green**, P. Breimyer, R. Krishnamurthy, and N.F. Samatova, *Systematic Evaluation of Convergence Criteria in Iterative Training for NLP*, 22nd International Florida Artificial Intelligence Research Society, Sanibel Island, Florida, 2009

N. Green, P. Breimyer, V. Kumar, and N.F. Samatova, *BioDEAL: Biological data-evidence-annotation linkage system*, IEEE International Conference on Bioinformatics & Biomedicine Workshops (BIBMW), Philadelphia, PA, pp. 99-106, 2008

N. Green, J. Kruger, C. Faldu, and R.S. Amant, *A reduced QWERTY keyboard for mobile text entry*, ACM's Computer Human Interaction (CHI) Conference on Human

Factors in Computing Systems, Vienna, Austria: pp. 1429-1432, 2004

M. Heil, R. Fornaro, **N. Green**, J. Maness, and W. Webb, *On becoming a winning student team: placing third in an international design competition*, 34th Annual Frontiers in Education (FIE), Savannah, GA, pp. F4G-1-5 Vol. 2., 2004

To Be Published:

Practical Graph Mining with R, Chapman and Hall/CRC, September 15th 2012

Chapter 4: Link Analysis

Chapter 5: Graph-Based Proximity Measures

**Conferences /
Invited Talks**

05/2012 *Building Parallel Corpora through Social Network Gaming*, LREC Workshop, Istanbul, Turkey

04/2012 *Hybrid Combination of Constituency and Dependency Trees into an Ensemble Dependency Parser*, EACL Workshop, Avignon, France

06/2011 *Dependency Parsing*, WDS11, Prague, Czech Republic

08/2010 *PackPlay: Mining semantic data in collaborative games*; The Fourth Linguistic Annotation Workshop (LAWIV); Uppsala, Sweden

05/2009 *WebBANC: Building Semantically-Rich Annotated Corpora from Web User Annotations of Minority Languages*; Nordic Conference on Computational Linguistics (NODALIDA); Odense, Denmark

05/2009 *Systematic Evaluation of Convergence Criteria in Iterative Training for NLP*; The 22nd International Florida Artificial Intelligence Research Society Conference (FLAIRS-22); Sanibel Island, FL

11/2008 *BioDEAL: Bringing Evidence-Based Research into the Research Life Cycle*; Conference on Bioinformatics and Biomedicine (BIBM); Philadelphia, PA

10/2004 *On becoming a winning student team: placing third in an international design competition*; Frontiers in Education (FIE); Savannah, GA

04/2004 *A reduced QWERTY keyboard for mobile text entry*; International conference for human-computer interaction (CHI); Vienna, Austria

**Research
Experience**

Early Stage Researcher (Fall 2010 - Fall 2013), Charles University, Prague, Czech Republic

- Work in Dependency Parsing and its effect on statistical machine translation
- Research into the use of self-training, ensemble learning, and active learning in dependency parsing
- Identifying machine learning techniques to aid in semi-supervised dependency parsing for under-resourced languages
- Clara training programs included: Consolidating and Harmonizing Treebank Annotation, Processing Morphologically Rich Languages, Product Planning for Next Generation Information Access Technology Solutions, and New Developments in Computational Linguistics.

Graduate Research Assistant (Fall 2007 - Fall 2009), North Carolina State University, Raleigh, NC USA

- Created and led three software development projects for collaborative data annotation to solve the machine learning's training data bottleneck: WebBANC, BiDEAL, and PackPlay
- Constructed experimental frameworks for research group to examine the use of semantic constraints in machine translation
- Research topics included:
 - **Machine Translation:** Semantic constraints with application to under-resourced languages, parallel corpora construction, and model selection via syntactic text clustering
 - **Natural Language Processing:** Systems for annotating web pages to create annotated corpora, empirical studies to demonstrate the usefulness of the web for minority language groups, convergence criteria for iterative training in NLP, and creating collaborative games to harvest training data for language technologies
 - **Biology Domain:** Application development to allow ontological annotation to link published documents with experimental data

Research Software/Tools

- PackPlay Collaborative Online Game Framework: **Nathan Green**, Paul Breimyer, Vinay Kumar, Nagiza F. Samatova (available upon request)
- Biological Data-Evidence-Annotation Linkage (BioDEAL): **Nathan Green**, Paul Breimyer, Vinay Kumar, Nagiza F. Samatova (available upon request)
- Web System to Build Annotated NLP Corpora (WebBANC): **Nathan Green**, Paul Breimyer, Vinay Kumar, Nagiza F. Samatova (available upon request)

Teaching Experience

North Carolina State University, Raleigh, NC USA, 2007-2010

Senior Design, CSC 492 (Spring 2010, Fall 2009)

Capstone 15-week project course for undergraduate seniors in Computer Science; students in the course are required to participate in an industrially-sponsored project that must be completed in accordance with a software development process (from requirements analysis to fully tested system). Each student becomes a member of a team, is expected to contribute to design, implementation and documentation of a project, and to make at least one technical oral presentation

- Class Size (64, 30) of graduating Computer Science Seniors
- Testing manager and teaching assistant
 - Instruct students in testing principles and policies
 - Grade test plans and provide feedback on oral presentations

Software Engineering, CSC 326 (Fall 2009)

Application of product engineering methods to software: quality assurance, project management, requirements analysis, specifications, design, development, testing, production and maintenance

- Class Size (54) of Computer Science Juniors and Seniors
- Lecturer, lab assistant, and teaching assistant
 - Instruct students in the Java programming language, Software Engineering principles, source control, and testing principles
 - Lead the students through requirements elicitation and analysis for their course project
 - Grade homeworks, course projects, and exams

Venezuela Practicum (Summer 2009, 2008, 2007)

Intensive two week class with a focus on software development for wireless sensor systems

- Class Size (18, 18, 16) of Senior level exchange students from Venezuela
- Responsible for the creation and instruction of labs
- Wireless Sensor Networks
 - Programming Sunspots in Java for wireless sensor applications
 - Integration of Sunspots with homebuilt robotics

NCSU Engineering Summer Workshops (Summer 2009, 2008)

The engineering summer workshops are week-long residential programs through which students can experience engineering, college life, and NC State University

- Class Size (30, 33) of high school students looking to pursue a career in Computer Science
- Graduate teaching assistant and lecturer
 - Teach fundamental Computer Science concepts through Alice and the use of an in-house robotics package for beginners
 - Create instructional labs and projects to demonstrate object oriented programming concepts for the students to demo to their parents and the Computer Science department
 - Create and instruct advanced students through more challenging Java and C projects

Professional Experience

The Bureau of Labor Statistics, Washington, DC USA (2003-2006)

IT Specialist and Software Engineer (GS-12)

- Designed, constructed, and maintained applications for economists and statisticians using ASP, Visual Basic, and Java J2EE technologies. All development followed IBM's Rational Unified Process
- Converted and redesigned main frame SAS statistical calculations to a J2EE architecture for the International Price Programs's indexes and quality measures

Requirements Analyst

- Lead requirements analysis for multiple ongoing projects in the Bureau which required the drafting and maintaining of requirements documents. Many times this included the development of early software prototypes
- Drafted and maintained requirement documents and software prototypes used by the department
- Analyzed and reviewed newly drafted requirements so that Bureau wide software development could maintain consistent standards in a cross-department requirements analysis team

IBM, Research Triangle Park, North Carolina USA (2001)

CO-OP Student for Options/Building Blocks Testing

- Mobile Options Testing: Created testing matrices to verify that new options would be compatible with IBM's supported mobile systems and that the legacy options were compatible with new mobile systems. Worked with the development team to find the causes of discovered bugs
- Technical Writing: Wrote troubleshooting guides for our customer support team; created and verified user manuals to be shipped with our options
- Customer Care: Worked with the business customers to recreate bugs and find workarounds that were acceptable for the customer until the development team could develop a fix

North Carolina State University Engineering Department, Raleigh, NC USA
(1999-2000)

Work Study Student

- Maintained a database of professors' research grants and tracked the progress of proposed grants

Service

Computer Science Graduate Applications Review Committee (2010)

- Reviewed applications under the guidance of the faculty
- Produced review assessments for Master's degree applicants

Computer Science Graduate Student Association Officer (2008-2010)

- Elected to represent the 400+ Computer Science graduate students
- Organize and assist in events for the academic and professional development of graduate students in Computer Science
- Plan social events for Computer Science graduate students to help promote community and diversity

References

Professor Nagiza F. Samatova, Advisor
North Carolina State University
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Department of Computer Science
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Raleigh, NC 27695-8206
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