

**CONTACT  
INFORMATION**

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**INTERESTS**

Data Science, Social Networks, Machine Learning, Big Data

**EXPERIENCE**

Research Assistant at the Salathé Group

Datamined large datasets including Twitter ( >1 tb ) and Open Street Map ( 400 gb)  
Text classification and Sentiment analysis involving Weka, Rapid Miner, and hand-built tools  
Rapid analysis of novel data source involving cellphone-based movement. (Less than one day from data acquisition to report.)

Complex Systems Summer School (CSSS) at Santa Fe Institute. (June 3-28, 2013)

Analyzed GIS data with a multidisciplinary, multicultural team.  
Surveys of the fields of: complexity, nonlinear dynamics, network structure and dynamics, computation theory and adaptive computation techniques, and machine learning.

Grader for senior level class: “Introduction to the Theory of Computation” (January - April 2012)

Developed answer keys, graded homework and exams, and interacted with students  
Topics covered include automata, Turing machines and complexity.

Undergraduate research with Penn State psychology department

Developed models for modified prisoner’s dilemma games (MOTH).  
Developed Map-Reduce tool for running NetLogo simulations on multiple computers. [Link](#)

**SOFTWARE  
DEVELOPED**

Super Stalker

Long term Twitter social network and user information collection

Crowdbreaks (Now defunct)

[www.crowdbreaks.com](http://www.crowdbreaks.com)  
Online disease surveillance system using social media.  
Worked on backend, developed system for fast processing of large geospatial data sets.

Flu Forecast

Android app that displays vaccination levels, Twitter data, and current influenza rates for the user’s location.

Cluster Logo [Link](#)

Map-Reduce-Style addon for Net Logo.

**COMPUTER SKILLS**

- Cluster Computing / Hadoop
- Web based psychological game development through Amazon Mechanical Turk
- Machine Learning, Data Mining, Database Management
- General software design / programing
- Java, Python, BASH, R, MatLab, L<sup>A</sup>T<sub>E</sub>X

## DEGREES

**Pennsylvania State University**, State College, Pennsylvania USA

PhD, Biology, Spring 2015 (Expected)

Advisor: Marcel Salathé

**Pennsylvania State University**

B.S., Computer Science, May, 2012

Junior/Senior GPA 3.90

Minor in Mathematics

PEER REVIEWED  
PUBLICATIONS

5. **Todd Bodnar**, Victoria Barclay, Nilam Ram, Conrad Tucker and Marcel Salathé. *On the Ground Validation of Online Diagnosis with Twitter and Medical Records* WWW 2014 [Link](#)
4. Zhuojie Huang, Udayan Kumar, **Todd Bodnar** and Marcel Salathé. *Understanding Population Displacements on Location-Based Call Records Using Road Data* SIGSPATIAL 2013, [Link](#)
3. **Todd Bodnar** & Marcel Salathé. *Validating Models for Disease Detection Using Twitter* WWW 2013 Companion, May 13-17, 2013, Rio de Janeiro, Brazil. [Link](#)
2. Marcel Salathé, Linus Bengtsson, **Todd J. Bodnar**, Devon D. Brewer, John S. Brownstein, Caroline Buckee, Ellsworth M. Campbell, Ciro Cattuto, Shashank Khandelwal, Patricia L. Mabry, Alessandro Vespignani. *Digital Epidemiology* Plos Computational Biology, 2012 [Link](#)
1. **Todd Bodnar** & Marcel Salathé. *Governing the Global Commons with Local Institutions*. PloS One, 2012 [Link](#)

IN PREP AND  
NON-PEER  
REVIEWED  
PUBLICATIONS

- **Todd Bodnar** & Marcel Salathé. *Detecting Hidden Information Flow on Twitter*
- Cheryl Abundo, **Todd Bodnar**, John Driscoll, Ian Hatton, and Jody Wright *City population dynamics and fractal transport networks* (Proceedings of Santa Fe Institute Complex Systems Summer School) [Link](#)

## INVITED TALKS

- Todd Bodnar. *The next generation of individual-based online surveillance.(working title)* Santa Fe Institute, May 2014

SELECT  
PRESENTATIONS

- Todd Bodnar. *Processing Big-Data for Cheap through Amazon's Elastic Map Reduce*. Hacking Science Seminar, February 2013
- Todd Bodnar, Orhan Kislal, Ying Sun, Hui Yang, Marcel Salathé, Conrad Tucker. *Webs, Clouds and Tweets: Using Social Media to Study the Spatial Dynamics of Influenza*. Center for Integrated Healthcare Delivery Systems, May 2012

## OUTREACH

- Session chair at WWW2014 title *Systems for Surveillance and Outbreaks*
- Ran local meet up for Machine Learning coursera course
- TA for Coursera course on epidemiology
- Communicated with 655 journalists as part of a launch of a Massively Multiplayer Online game

## MISCELLANEOUS

- Erdős number: 3 (Todd Bodnar → Alessandro Vespignani → Fan Chung → Paul Erdős )
- American citizenship
- Links to software and publications available on ToddBodnar.com
- Updated copy available at [www.github.com/ToddBodnar/CV](http://www.github.com/ToddBodnar/CV)