CURRICULUM VITAE

**Margaret P. Chapman**
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## EDUCATION

**University of California**, **Berkeley**, 2014-present, GPA 3.945
Ph.D. Candidate in *Electrical Engineering and Computer Sciences*, expected 2020
*NSF Graduate Fellow* and *Berkeley Graduate Fellow*
*Advisor*: Professor Claire J. Tomlin
*Dissertation Topic*: Modeling and Controller Design for Naturalistic Dynamical Systems with Uncertainty

**Stanford University**, 2008-2014
M.S., Mechanical Engineering, 2014, GPA 3.991
B.S., Mechanical Engineering *with Distinction*, 2012, GPA 3.983

## CURRENT RESEARCH AREAS

**Modeling & Analysis of Triple-Negative Breast Cancer via Switched Dynamical Systems**
-System identification to predict the effects of drug treatment on cellular phenotypes;
-Statistical inference to estimate uncertainties in model parameters;
-Theoretical design and analysis of drug schedules to inform future experimentation;
-Applied to empirical data from a Triple-Negative breast cancer cell line.

**Risk-Sensitive Reachability Analysis as a Design Tool for Stormwater Systems**
-Reachability analysis applied to quantify system robustness in the presence of rainfall uncertainty;
-Extending reachability analysis to appreciate a notion of risk via financial risk metrics;
-Applied to a two-pond system in Lenexa, Kansas.

## PEER-REVIEWED PUBLICATIONS (accepted, under review, or in preparation)

*Accepted*

**Chapman**, et al. (2016, December). A model of phenotypic state dynamics initiates a promising approach to control heterogeneous malignant cell populations. In *55th IEEE Conference on Decision and Control*, pp. 2481-2487.

**Chapman**, et al. (2014, August). Position and velocity cursor mappings contribute to distinct muscle forces in simulated isometric and movement reaching. In *5th IEEE RAS & EMBS International Conference on Biomedical Robotics and Biomechatronics*, pp. 597-603.

Fridovich-Keil, Hanford, **Chapman**, et al. (2017, October). A Model Predictive Control Approach to Flow Pacing for TCP. In *55th Annual Allerton Conference on Communication, Control, and Computing*.

*Under review*

**Chapman**, et al. On the Analysis of Cyclic Drug Schedules for Cancer Treatment using Switched Dynamical Systems. Under review for *2018 IEEE Conference on Decision and Control*.

Risom, Langer, **Chapman***, Rantala*, et al. Differentiation-state plasticity is a targetable resistance mechanism in basal-like breast cancer. Under review for *Nature Communications*. *Equal contributions

**Chapman**, et al. Reachability Analysis as a Design Tool for Stormwater Systems. Extended abstract under review for *2018 IEEE Conference on Technologies for Sustainability*.

*In preparation*

**Chapman**, et al. Modeling phenotypic-state transitions that are linked to therapeutic escape in triple-negative breast cancer. In preparation for *PLoS Computational Biology*.

## INVITED TALKS

**Chapman**, et al. (2015, November). A linear time-invariant model of phenotype dynamics in breast cancer cell populations. In *8th Annual RECOMB/ISCB Conference on Regulatory and Systems Genomics*. https://www.iscb.org/recomb-mm/media-recombrsg2015

## HONORS & AWARDS

**NSF Graduate Research Fellowship** *(tuition & stipend for 3 years, project-independent)* 2014

**Berkeley Fellowship for Graduate Study** *(tuition & stipend for 2 years, project-independent)* 2014

Tau Beta Pi-Williams Fellowship *(award of 10K by TBP Engineering Honors Society)* 2014

**Fulbright Scholarship** 2012

*To study socio-political-economic context of social-impact engineering, awarded by U.S. Dept. of State*
*Declined to pursue M.S. in mechanical engineering at Stanford University*

Terman Engineering Scholastic Award *(to top 5% of seniors in Stanford School of Engineering)* 2012

Finalist, Rhodes Scholarship 2011

Strauss Public Service Scholarship *(for micro-hydro rural electrification project in Peru)* 2011

Honorable Mention, Barry M. Goldwater Scholarship 2010

Stanford Undergraduate Advising and Research Small Grant 2009 & 2010

*For research in paleobiology and rural electrification, respectively*

## TEACHING

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| Graduate Student Instructor, Discrete Mathematics & Probability Theory | Summer & Fall 2017 |
| Graduate Student Mentor, Linear System Theory | Fall 2015-2017 |
| Graduate Student Instructor, Feedback Control Design | Spring 2014 |
| Undergraduate STEM Tutor at Stanford Center for Teaching and Learning | Fall 2010, Winter 2011 |

## EMPLOYMENT

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| Graduate Student Researcher, UC Berkeley, Advisor: Claire Tomlin | Jan. 2015-present |
| Robotics Student Associate, SRI International, Menlo Park, CA | Summer 2013 |
| Quality Engineering Intern, Boston Scientific, Los Gatos, CA | Summer 2012 |

## SERVICE

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| Berkeley Artificial Intelligence Research mentor | Spring 2018 |
| Prisoner's Literature Project | Oct. 2017-present |
| *Provide books and write letters to inmates across the U.S.* | |
| Tau Beta Pi MindSET (*explored robotics with underrepresented kids*) | Winter & Spring 2013 |
| Engineers for a Sustainable World, Stanford University | |
| *Led micro-hydro rural electrification project for one year* | 2011 |
| *Co-instructor for project-based class, Design for a Sustainable World* | Winter 2011 |
| Haas Center for Public Service, Stanford University | |
| Kids with Dreams (*swimming with kids with special needs*) | Spring 2010 |
| Tutoring for Community | Winter 2010 |
| Science in Service (*teaching science to underrepresented kids*) | Fall 2009 |

## PROFESSIONAL & ACADEMIC AFFILIATIONS

Institute of Electrical and Electronics Engineers (IEEE)
Berkeley Artificial Intelligence Research (BAIR)
Cancer Systems Biology Consortium/Physical Sciences Oncology (CSBC/PS-ON)

Chapman, M. P. & Tomlin, C. J. (2016). Ordinary Differential Equations in Cancer Biology. *CSBC/PS-ON Handbook of Mathematical Oncology*. https://www.biorxiv.org/content/early/2016/08/23/071134

Tau Beta Pi, Engineering Honors Society, California Gamma Chapter
Stanford Alumni Association