Jessica Su
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Education

- **California Institute of Technology** — Pasadena, CA
  Senior, Computer Science (3.8 GPA) — *September 2007 - present*

Publications

- Marcolli M and **Su J** (2011) Arithmetic of Potts Model Hypersurfaces. International Journal of Geometric Methods in Modern Physics, in press. arXiv:1112.5667 [math-ph].
- Liebovitch L, Peluso P, Norman M, **Su J**, Gottman J (2011) Mathematical model of the dynamics of psychotherapy. Cognitive Neurodynamics 1-11.
- Peluso P, Liebovitch L, Gottman J, **Su J** (2011) A mathematical model of psychotherapy: an investigation using dynamic non-linear equations to model the therapeutic relationship. Psychotherapy Research.
- Ward C, **Su J**, Huang Y, Lloyd A, Gould F, Hay B (2011) Medea selfish genetic elements as tools for altering traits of wild populations: a theoretical analysis. Evolution 65:1149-1162.
- Hay B, Chen CH, Ward CM, Huang H, **Su JT**, Guo M (2010) Engineering the genomes of wild insect populations: Challenges, and opportunities provided by synthetic Medea selfish genetic elements. Journal of Insect Physiology 56(10):1402-1413.
- Chen CH, Huang H, Ward CM, **Su JT**, Schaeffer LV, Guo M, Hay BA (2007) A synthetic maternal-effect selfish genetic element drives population replacement in Drosophila. Science 316:597-600.

Conferences

- M.D. Norman, L.S. Liebovitch, P.R. Peluso, **J. Su**, J.M. Gottman. Mathematical Model of the Dynamics of Psychotherapy. International Conference on Complex Systems, June 2011, Cambridge MA.
- L. S. Liebovitch, P. R. Peluso, **J. Su**, J. Gottman. 2010. Mathematical Model of Psychotherapy - A New Approach to Understanding the Therapeutic Relationship. Association for Psychological Science, May 29, 2010, Boston MA.

Research Experience

- **Marcolli Group, Caltech, Department of Mathematics** — Pasadena, CA
  Summer Undergraduate Research Fellow — *June 2011 - August 2011*
  - Used numerical and analytical methods to determine if Tutte polynomials satisfied the Kontsevich conjecture.
- **Tenenbaum Lab, MIT, Department of Brain and Cognitive Sciences** — Cambridge, MA
  Research Intern — *June 2010 - August 2010*
  - Ran computer-based experiments to explore how people learn new words.
- **Liebovitch Group, FAU, Complex Systems and Brain Sciences** — Boca Raton, FL
  Research Intern — *November 2009 - February 2010*

- Used nonlinear differential equations to model therapist-client interactions.
- Solved the equations of the model analytically.

- **Phillips Lab, Caltech, Department of Biology** — Pasadena, CA
  Summer Undergraduate Research Fellow — *June 2007 - August 2007*
  - Used a modified version of BLAST to search for motor proteins in bacteria.

- **Hay Lab, Caltech, Department of Biology** — Pasadena, CA
  Research Intern — *June 2006 - August 2006*
  - Modeled the dynamics of maternal-effect selfish genes.

Skills

- **Computer science classes:** CS 21 (theory of computation), CS 38 (algorithms), CS 156ab (machine learning), CNS 187 (neural computation), CS 153 (lattices and convexity), CS 117 (computability theory)
- **Math classes:** Ma 108ab (real analysis), Ma 5abc (abstract algebra), Ma 121 (combinatorics), ACM 116 (stochastic processes), ACM 101 (differential equations and dynamical systems), Ma 112 (statistics)
- **Other classes:** Ph 12abc (waves, quantum mechanics, and statistical physics), EE 127 (error-correcting codes), BE 150 (systems biology)
- **Computer skills:** Python, MATLAB, Mathematica, Java, Perl, C, C++, Unix, LaTeX

Work Experience

- **Protabit LLC** — Pasadena, CA
  Consultant — *June 2012 - September 2012*
  - Benchmarked Protabit's bioinformatics tools on a large protein database.
  - Used company software to design new proteins with similar functionality to existing proteins.

- **Kaplan Test Prep and Admissions** — Boca Raton, FL
  Instructor — *July 2008 - March 2009*
  - Taught SAT preparation classes. Tutored individual students for the SAT and SAT II.

Awards

- Summer Undergraduate Research Fellowship (2011, 2007)
- Top 500 Putnam (2008)
- Lingle Scholarship (2007, awarded to top two freshmen in incoming class)
- Axline Scholarship (2007, full ride)
- US Physics Olympiad semifinalist (2006)
- US Chemistry Olympiad semifinalist (2006)
- Intel International Science Fair (2007)
- Siemens AP Scholar (2006, awarded to 2 high school students per state)

References

- Dr. Bruce Hay, haybruce@its.caltech.edu, 626.395.3399
- Dr. Matilde Marcolli, matilde@caltech.edu
- Dr. Eric Peterson, atomicpirate@gmail.com