

Timmy Siau

Contact

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Education

Ph.D.	UC Berkeley, Civil and Environmental Engineering	2012
M.S.	UC Berkeley, Civil and Environmental Engineering	2008
B.S.	UC Berkeley, Civil and Environmental Engineering	2006

Employment

STEM Academic Advisor @ SURF, UC Berkeley

01/15 - 08/15

I advised 60+ students for the Summer Undergraduate Research Fellowship (SURF). Advising students included mentoring them through writing a research proposal and giving them feedback throughout the summer. I coached 40 students to give a talk on their research to a general audience for the capstone research conference for the program. For most students, it was their first talk in a formal setting. I re-designed the application on WizeHive to be more efficient and accessible.

CEO @ Nimble Radiotherapy

06/14 - 07/15

I founded a startup company, Nimble, to develop a web-based software planning tool for radiation oncologists. I did product development, full stack web development, user interface design, and market validation.

Post-doctoral Researcher @ Dept. Radiation Oncology, UCSF

01/13 - 06/14

I helped develop a Philips prototype system for prostate, permanent-seed implant brachytherapy. The system incorporated real-time ultrasound, deformable image registration algorithms and an electromagnetic needle tracking system. I performed benchmark testing for the system in gelatin phantoms and gave feedback on the user interface design.

I also developed and tested an end-to-end workflow for building custom brachytherapy applicators. This workflow required combining patient scans and user input into a 3D model of an applicator, sourcing the 3D printing, validating the printed applicator, cleaning it, and streamlining the workflow to be clinically viable.

I recruited and mentored several undergraduate student researchers from UC Berkeley, including two that published journal articles (see Nattagh et al, 2013 and Cunha et al, 2015).

Graduate Student Researcher @ UC Berkeley

08/12 - 12/12

I developed algorithms based on linear and integer programs that computed needle configurations and dose distributions for high dose rate brachytherapy. I designed the linear and integer programming models, analyzed their properties when appropriate, and tested them on data taken from patients previously treated at UCSF. To support this work, I also developed a Matlab toolbox for loading patient data sets, inputting parameters, and testing new planning algorithms on batches of data. In one study, I integrated these planning algorithms on the Acubot-RND, a needle insertion robot developed at Johns Hopkins University, to determine the feasibility of automating the needle insertion process of brachytherapy. This study won the Best Application Paper Award at the Conference for Automation Science and Engineering in 2012.

Graduate Student Instructor @ UC Berkeley

08/06 - 05/11

During various semesters, I was the head TA, discussion leader, lab instructor, and assignment writer for E7, an introductory programming course for engineers. Each semester, E7 has approximately 400 students, making it the largest course in the College of Engineering at UC Berkeley. In addition to my regular responsibilities as a TA, I contributed an automatic grading system, which reduced 40 grading hours per week to as little as 1 hour per week, and a semester project, which won me the Teaching Effectiveness Award in 2008. The Teaching Effectiveness Award is given to approximately 10 of the 1000 TA's each semester, and I was the first TA in the Civil Engineering department to ever win this award. My teaching experience culminated in a Matlab textbook, which is used at UC Berkeley, San Diego State University, and Carnegie Mellon University.

Publications

Cunha, J. Adam M., Katherine Mellis, Rajni Sethi, **Timmy Siau**, Atchar Sudhyadhom, Animesh Garg, Ken Goldberg, I-Chow Hsu, and Jean Pouliot. "Evaluation of PC-ISO for Customized, 3D Printed, Gynecologic 192-Ir HDR Brachytherapy Applicators." *Journal of Applied Clinical Medical Physics* 16, no. 1 (2015)

Nattagh, Khashayar, **Timmy Siau**, Jean Pouliot, I-Chow Hsu, and J. Adam Cunha. "A training phantom for ultrasound-guided needle insertion and suturing." *Brachytherapy* 13, no. 4 (2014): 413-419

Garg, Animesh, Sachin Patil, **Timmy Siau**, J. Adam M. Cunha, I-Chow Hsu, Pieter Abbeel, Jean Pouliot, and Ken Goldberg. "An algorithm for computing customized 3D printed implants with curvature constrained channels for enhancing intracavitary brachytherapy radiation delivery." In *Automation Science and Engineering (CASE), 2013 IEEE International Conference on*, pp. 466-473. IEEE, 2013.

Garg, Animesh, **Timmy Siau**, Dmitry Berenson, J. Adam M. Cunha, I-Chow Hsu, Jean Pouliot, Dan Stoianovici, and Ken Goldberg. "Robot-guided open-loop insertion of skew-line needle arrangements for high dose rate brachytherapy." *Automation Science and Engineering, IEEE Transactions on* 10, no. 4 (2013): 948-956.

Integer Programs for High Dose Rate Brachytherapy Needle and Dose Planning that Directly Optimize Clinical Objectives (dissertation)

Siau, **Timmy**, Adam Cunha, Dmitry Berenson, Alper Atamtürk, I-Chow Hsu, Ken Goldberg, and Jean Pouliot. "NPIP: A skew line needle configuration optimization system for HDR brachytherapy." *Medical physics* 39, no. 7 (2012): 4339-4346.

Siau, **Timmy**, Adam Cunha, Alper Atamtürk, I-Chow Hsu, Jean Pouliot, and Ken Goldberg. "IPIP: A new approach to inverse planning for HDR brachytherapy by directly optimizing dosimetric indices." *Medical Physics* 38, no. 7 (2011): 4045-4051.

Book

Siau, **Timmy**, and Alexandre Bayen. *An Introduction to MATLAB® Programming and Numerical Methods for Engineers*. Academic Press, 2014

Patent

Patient-specific temporary implants for accurately guiding local means of tumor control along patient-specific internal channels to treat cancers. Provisional Patent Application 61859687. July 2013.

Programming

Matlab, Python, CPLEX, HTML, CSS, Javascript, Node.js, Backbone.js, three.js, paper.js, D3.js, Angular.js

Awards

Best Application Paper Award, CASE 2012
8/12

Instructional Distinction Award, UC Berkeley
Sp. '11

Teaching Effectiveness Award, UC Berkeley
Sp. '08

Outstanding GSI Award, UC Berkeley
Sp. '08