

Timothy Hickey
Computer Science

Instructional Activities

Term	Course Number	Course Description	Enrollment
Summer 2017	COSI 154AJ 1	JBS INCUBATOR	19
Summer 2017	COSI 293G 2	MASTERS RESEARCH INTERNSHIP	2
Summer 2017	COSI 152AJ 1	WEB APPLICATION DEVELOPMENT	19
Fall 2017	COSI 400D 1	DISSERTATION RESEARCH	3
Fall 2017	TYP 6A 1	TYP: COMPUTER SCIENCE	18
Fall 2017	COSI 98A 1	INDEPENDENT STUDY	6
Fall 2017	COSI 11A 2	PROGRAMMING:JAVA AND C	146
Fall 2017	COSI 93A 1	RESEARCH INTERNSHIP & ANALYSIS	1
Spring 2018	COSI 155B 1	COMPUTER GRAPHICS	155
Spring 2018	COSI 210A 1	INDEPENDENT STUDY	1
Spring 2018	COSI 12B 2	ADV. PROGRAMMING TECHNIQUES	94
Spring 2018	COSI 400D 1	DISSERTATION RESEARCH	3
Spring 2018	COSI 98B 1	INDEPENDENT STUDY	4

Teaching innovations:

I revised the MKTYP6a course so that it uses Python with the hope that this would make it easier for MKTYP students to take the CS2a Introduction to Computers class and then start the core CS courses CS11a,12b if they wanted.

In Fall17, I created a new educational technology web app that I call the Peer Review App (PRA deployed at <http://gracehopper.cs-i.brandeis.edu:3500>) and I've used it in my small MKTYP6a class and the three large courses I've taught (CS11a, CS12b, CS155b) to engage students in problem solving and in higher order thinking by having them review, critique, and debug the answers of the peers to question that I ask and they answer during class.

This pedagogy keeps all students engaged since those who have finished answering the question move on to the critique phase where they review the answers of their peers, until I decide when to stop the activity (by looking at the summary data provide by the app). Students are required to complete these problems at home if they don't finish them in class.

As of 3/29/2018 the PRA site has been used by 473 students who have supplied 20,085 answers to 245 questions, and have written 104,622 reviews of each others answers. This averages to about 40 answers/student and 200 reviews/student. Most of this activity is from the 4 classes I taught this year. I have submitted a Teaching Innovation proposal to extend this app and make it available to all Brandeis faculty.

I have also continued to screen record and live stream all of my big classes and to allow student to attend virtually as long as they answer all of the questions that I pose in class before the class is over.

I start every class with a short list of the learning objectives for the lesson (-- you will be able to ...) and end every class by having the students self-assess their confidence in their level of mastery of the learning objectives.

I intersperse short lecturing sessions with problem solving challenges in every class and I use NotaBene for all of my assigned reading, so that students are required to make comments on the text that all other students can see and respond to.

I've introduced Final Project showcases on the last day of class in all of my big classes (these are held in the Science Center Atrium) and this semester I'm having a preview showcase 3 weeks before the end of class so that students can review each others projects in process and both be inspired by each other and provide constructive criticism and helpful suggestions in their reviews.

I also taught a 2 week High School App Design Summer Program for about 25 High School students working with Marci Borenstein in the Brandeis Pre-College office. We typically have one or two top students from that program matriculate to Brandeis each year. We also work to form a diverse group of students and teaching assistants each summer, in terms of sex, gender, race, and ethnicity.

Reading courses, theses, dissertations, research projects (undergraduate and graduate):

All this year I have been working with two Schiff Fellows: Jane Kwon is doing a study of the factors effecting diversity in the Computer Science major, and Devi Acharya is studying an approach to enhancing relaxation using Virtual Reality and portable EEG sensors.

In the Fall semester, I oversaw two student research projects:
Multiplayer VR Games: Kelvin Mei, Gavin Yahna, Vince Lauffer
DeisToday Project: Ari Carr, Aaron Gold, Zach Weiss

In the Spring semester, I supervised two student research projects:
TheaterApp - I worked with a group of three CS senior women to look into developing web apps to support theater arts
21st Century Skills - I worked with an MA student, Bill DeRusha, to build a web-based game to teach 21st Century Skills to high school students

I have three PhD students:

- * Fatima Abu Deeb, successfully defended her dissertation and will be submitting the final version in early April.
- * Kristian Kime is planning to complete by Spring 2019
- * Xiaodong Qu has just started last year and will probably complete in Spring 2021

Advising and Mentoring (undergraduate advisees, graduate advisees, teaching fellows, other interactions, office hours):

Undergraduate Students: 7 Graduate Students: 5

My Office Hours vary from semester to semester. This semester they are Wed 12-2, Thu 11-12 or by appointment.

I meet weekly with my teaching fellows.

I helped organize the Computer Science Career Fair in October which attracted more than 30 companies and about 150 students.

Scholarship

Conference Paper(s)

Abu Deeb, Fatima and Hickey, Timothy J. "SPINOZA: In-class Python Problem Solving with Classroom Orchestration (Abstract Only)." The 49th ACM Technical Symposium on Computer Science Education (SIGCSE 2018), Baltimore, MD. Feb 21-24 2018.

Qu, Xiaodong and Hall, Mercedes and Sun, Yile and Sekuler Robert and Hickey, Timothy J. "A Personalized Reading Coach using Wearable EEG Sensors: A pilot study of brainwave learning analytics." Analytics in Education Environments (A2E18), Funchal, Maderia, Portugal. March 15-18 2018.

Abu Deeb, Fatima and Hickey, Timothy J. "Using Fine Grained Programming Error Data to Enhance CS1 Pedagogy." Computer Supported Education (CSEDU18), Funchal, Madeira, Portugal. March 15-17 2018.

Kime, Kristian and Hickey, Timothy J and Torrey, Rebecca. "The Calculus Dashboard - leveraging intelligent tutor techniques to provide automated fine-grained student assessment." Frontiers in Education (FIE17), Indianapolis, IN. October 18-21, 2017.

Abu Deeb, Fatima and Hickey, Timothy J. "Flipping Introductory Programming Classes using Spinoza and Agile Pedagogy." FIE2017, Indianapolis, IN. October 18-21 2017.

Hickey, Timothy J. "Groupwork: Learning During Collaborative Assessment Activities." Computer Supported Collaborative Learning (CSCL2017), Philadelphia, PA. June 18-22, 2017.

Journal Article(s)

Hickey, Timothy J. "Catching Audiovisual Interactions With a First-Person Fisherman Video Game." iPerception 46. 7 (2017): 793-814.

Ongoing Work

I have had three paper abstracts accepted for Frontiers in Education 2019 and will be

submitting the final versions for final peer review in late April.

I have also submitted a paper to the Journal of Games and Simulation which was returned for revisions and plan to resubmit in the next few months.

Service

Arts and Sciences

From: 01/2017 Through:04/2017 Member

Other

Search Committee for Hires in the First Year Writing Program

From: 09/2017 Through:08/2018 Member

Other

University Writing Committee

From: 09/2016 Through:06/2017 Member

Committee for the Support of Teaching (CST)

From: 09/2014 Through:08/2018 Member

Other

MKTYP Advisory Committee

From: 09/2015 Through:03/2018 Member

Other

Experiential Learning Advisory Committee

Department Activity

From: 09/2017 Through:04/2018 Member

Other

Graduate Admission Committee

University Activity

From: 09/2016 Through:05/2017 Co-Director

Other

Head Faculty Fellow for the Center for Teaching and Learning

From: 09/2014 Through:08/2018 Member

Other

Center for Teaching and Learning Advisory Committee

From: 08/2013 Through:08/2017 Chair

The Committee on Faculty Rights and Responsibilities

Other Service

I helped organize the 2017 Computer Science Reunion in June on Saturday of Reunion weekend and I participated in a panel discussion for the class of 2017 about Education at Brandeis

I helped organize the 2017 Computer Science Career Fair with Hiatt which attracted over 30 companies and over 150 Brandeis students.

I was on a panel for prospective STEM students last Spring (and will be on another one next month!)

Grant Activity**Grant Proposals**

Title: Unamuno: CyberTeaching with Deep Social Learning Platforms

Role: Principal Investigator

Sponsor: National Science Foundation

Total Cost: \$ 598,186

Start Date: 09/01/2018 **End Date:** 08/31/2021

Grant Awards**Honors and Awards**

Title

From

Thru

Intellectual Property

Intellectual Property

Professional Activities Outside the University

Professional activities (delegate, invited presenter, organizer, moderator, etc. at academic conferences, lectures, speeches and presentations) given outside the university.

Editorial work, reviews of publications, and membership on selection committees for national fellowship and grant programs

Society memberships

I am a member of the Association for Computing Machinery (ACM) and the IEEE Society

Work Outside the University

Courses taught at other institutions.

None

Employment and/or consultant arrangements

I was an external reviewer of the Computer Science Program at University of Massachusetts at Lowell in Feb 2017. We were tasked with evaluating the quality of the department and making suggestions for its future directions and spent 2 days meeting with students, faculty, and administrators before writing our report.

Management of fiduciary activities in which you have a role as an officer, director, trustee, supervisor, or founder with respect to any corporation, organization, or group

Intellectual property which has been developed by you outside of Brandeis University

Other

Additional Comments

Please indicate below any additional information or clarification that you think would be helpful to your Chair and the Dean regarding your work this year and your plans for the next several years. This could include: did you participate in any programs/workshops/events related to excellence in teaching during the academic year? If so, in what ways did you change or revise your teaching as a result? It may also include in what ways you have engaged in issues of diversity and inclusion in your teaching, research, mentoring of students or otherwise in the past year.

I have attended some of the workshops on Diversity run by Dr. Brimhall-Vargas and I am planning on creating a Computer Science Diversity Task Force to help increase the diversity of our department.

Please feel free to include additional information such as new courses you might be interested in teaching, service or advising responsibilities that you would be willing to take on, grant or fellowship applications you have in process, new research you plan to undertake, or other information about the trajectory of your artistic creation or scholarship.

I am very interested in developing new approaches to increasing diversity in STEM programs and especially in Computer Science.

For the first time ever, our introductory CS courses were 50% female and 30% of our graduating seniors in CS were female last year. This is much better than the national average of 19% female graduating seniors. I think that we can achieve a fully diverse major in the next five years by relying on scholarship on teaching and learning in STEM to drive changes to our curriculum and departmental practices.