Odd Pairings
A symposium on interdisciplinary, computational research

Abstract

The proposed symposium for University of Miami (UM) graduate and undergraduate students is designed as a deep dive into interdisciplinary pairings between a number of disciplines and computational science. The symposium will begin with an invited speaker seminar by an artist who creates artwork by writing computer code. As a (not very) odd pairing between art and computer science, this will frame interdisciplinarity as something closely intertwined with creativity, and challenge assumptions about who can learn programming. The invited speaker seminar will be followed by a panel of UM faculty representing additional, diverse examples of interdisciplinary pairings. The symposium will conclude with break-out mentoring sessions for students to connect with each of the panelists and the invited speaker.

Activity Goals (345 words)

The goals of this symposium are:
(a) to increase awareness of the possibilities of interdisciplinary pairings, in particular, pairings of any discipline with computational science, (b) to encourage students to pursue development of their computational skills, thereby strengthening their competitive career advantage, (c) to increase visibility of opportunities to participate in computational research projects at UM, and (d) to lay part of the foundation that can help strengthen UM as a hub for technological and computational innovation.

Hybrid individuals, who have computational skills in their toolbox in addition to their domain skills and interests, will likely have a larger role to play in creating the next technological innovations. In addition, hybrid teams consisting of members from different disciplines will have a similarly increasingly large role to play in shaping how these industries interact with each other in determining the sum total of our experience. The proposed symposium is one step towards integrating these ideas into our academic environment and making them part of our culture.

The Research Intersections Initiative brings the conversation about interdisciplinary collaborations to graduate students. Although the Center for Computational Science (CCS) participates in Research Intersections in an advisory role, the focus is not on computational research pairings, nor on actively providing opportunities to participate...
in projects. Furthermore, undergraduate students have even fewer opportunities to be exposed to interdisciplinary, computational research.

CCS is well integrated with the UM academic community, through joint projects with faculty in architecture, geography, computer science, pharmacology, neuroscience, marketing, communication, marine science and others. There are many opportunities for students to participate in research in these interdisciplinary projects, but little visibility of these opportunities.

The student stage is a prime time for the symposium to (a) instill the ideas of interdisciplinary pairings and hybrid skillsets into the student mindset, (b) encourage the development computational skills that can be combined with the student’s domain of interest, making them highly competitive in the job market, and (c) invite students to participate in the interdisciplinary, computational research projects with UM faculty, including but not limited to faculty who are CCS members.

**Personal Goals (187 words)**

Many of the programs that I run at the Center for Computational Science, as well as those that I have created, depend on an awareness that academia, industry, and eventually the public sector, will be pushed forward by interdisciplinary, computational approaches to problem solving. My research projects in the genomics of complex diseases will benefit from diversity of thought, and the energy that highly motivated undergraduates can bring in. In addition, my interdisciplinary research projects in data science education, the digital humanities, and remote sensing rely on interdisciplinary teams of researchers and undergraduate interns from across the University, which were not easy to assemble. In addition, I think of myself as a hybrid scholar, and I am most interested in working in interdisciplinary teams. As a hybrid, I have had trouble finding a place in the established culture where I belong. Having an institutional culture in which everyone is aware of interdisciplinarity as a key component of innovation will (a) make it easier to put interdisciplinary teams together, and (b) acknowledge that it’s okay if some scholars don’t fit cleanly in any of the pure disciplines.

**Budget and budget justification**

Possible invited speakers for the symposium include Casey Reas, Professor at UCLA Design Media Arts, Ben Fry, founder of Fathom Information Design, Inc. based in Boston, MA, or Lauren McCarthy, Assistant Professor at UCLA Design Media Arts. Reas and Fry co-wrote the Processing programming language in 2001, used by artists,
designers, architects, educators and makers to make works of art and information by writing code. Lauren McCarthy wrote the p5.js javascript library, used by the same populations but for the web. A budget of $3200 is requested as follows:

Travel and accommodation for the guest speaker: $1200  
Symposium dinner: $25 per person x 50 = $1250  
Total: $2450

The symposium dinner will be served buffet-style during the break-out mentoring sessions for 50 attendees. The cost is based on estimates from University-approved caterers.

Publicity costs are minimal because we will use the following methods to publicize the symposium: (a) word-of-mouth through our CCS Ambassadors, (b) electronic distribution of email invitations by our faculty member partners in many departments across the University as well as the residence halls mailing lists, and (c) announcing the event on the CCS website at ccs.miami.edu.

CV

a. Professional Preparation
University of Leicester Leicester, UK  Biochemistry & Genetics  BSc 2008  
University of Miami Miami, FL, USA  Human Genetics & Genomics  PhD 2014  
Yale University New Haven, CT, USA Computational Genetics  2014-2015

b. Appointments
Director of Programs, Center for Computational Science, University of Miami, Miami, FL USA  
Director of STEM Curriculum, Sheck Hillel Community School, Miami, FL, USA

c. Products


d. Synergistic Activities
1. Direct the yearly Center for Computational Science “Girl Scouts Can” Tech Event, where middle and high school girls spend a day on the University of Miami campus with faculty and graduate students in STEM fields. Activities focus on algorithmic thinking, coding, visualization and career exploration. (2016 onwards)
2. Developed the yearly “Data Scholars” program at the University of Miami, a data immersion, month-long summer program for foster care youth, homeless youth or similarly disadvantaged youth. (2017)
3. Developed the curriculum for “Data Modeling”, a year-long, project-based course that introduces 11th and 12th grade high-school students to the field of data science. (2015 – 2016)
4. Developed curriculum and coached teachers through the pilot testing of “Introduction to Biomedical Engineering”, a year-long course that strengthens 10th grade high-school students’ critical thinking and design thinking skills. (2015 – 2016)
5. Founded and chaired the Steering Committee of “Research Intersections”, a University of Miami initiative designed to broaden the participation of researchers from a diverse set of disciplines in collaborative projects. (2012 – present)

e. Collaborators & Other Affiliations
1. Collaborators - total number of collaborators and co-editors (1)
   Luisa Bernardinelli, University of Pavia
   James Hicks, University of Washington

2. Graduate Advisor(s) - total number of Graduate Advisors (2)
   Jacob McCauley, University of Miami; William Scott, University of Miami (committee chair)

3. Postdoctoral Sponsor(s) - total number of Postdoctoral Sponsors (1)
   Chris Cotsapas, Yale University and Broad Institute of Harvard and MIT

4. Thesis advising and Scholar Sponsor

   Postgraduate-Scholar Advisor (1)
   Elena Bonmati-Gonzalvez (UGrow fellow)

   Undergraduate-Scholar Advisor (1)
Christopher Frederick Schenker