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Logging on to the Future: Opportunities beckon for First Graduates of Colby's interdisciplinary Computation Majors

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Opportunities beckon for first graduates of Colby's interdisciplinary computation majors

By Jenny Chen '12 Photography by Jacob Kepler

The theater is so dark that theatergoers can be heard, but not seen, as they shift in seats, clear throats, shush children. As cymbals crash, Emily Post '15 presses the "Go" button on the lighting console and launches a series of effects she and her classmates created. Streaks of purple, blue, and yellow slice through the darkness. It's as if the lights are dancing to the music. On a particular beat they go from center stage outward before fading with the music, resolving into a beautiful blue.

Post remembers her final showcase at the Stagecraft Institute of Las Vegas. "It's really stirring to think about how to make a whole performance look a certain way just with the lights. You can use the lights to emphasize whatever emotion is going on."

Post is one of the first interdisciplinary computation majors to graduate from Colby, in her case the major linked to theater and dance. She received a scholarship to SILV, a highly competitive summer program that offers training in entertainment technology—the wizardry that controls special effects, flies actors across Broadway stages, and creates lighting designs for live events, movies, and theater productions. Post traveled to sets around Las Vegas, learning from professionals who create Cirque du Soleil and other iconic shows.

The combination of skills, Post said, gave her an entrée into the hottest area of the entertainment industry. "I went to a couple of conferences and I was able to walk up and introduce myself, [saying], 'I'm majoring in computer and theater,'" Post said. "They'd say 'What? I want to talk to you!'"

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>
> —Professor of Computer Science Bruce Maxwell

Colby's new majors in interdisciplinary computation are growing as students add computer science skills to their interests in theater, biology, environmental studies, and music. The majors, uncommon at liberal arts colleges, have married seemingly disparate fields and have opened a new world of job and research opportunities.

"There are quite a few colleges that have experimented with adding a computational component as a minor to supplement a major, but doing this as a major is pretty unusual," said Valerie Barr, professor of computer science at Union College and former program director for the Division of Undergraduate Education for the National Science Foundation. "But I think we're going to see increasing leadership in experimenting with adding that computational element in the liberal arts schools."

The IC majors were the brainchild of Professor Bruce Maxwell, chair of the Department of Computer Science, who arrived on Mayflower Hill in 2007 with ambitions to integrate his field across other disciplines. "I was interested in taking advantage of being at a liberal arts college and creating more opportunities for interdisciplinary work," said Maxwell, who graduated from Swarthmore with degrees in engineering and political science, with a concentration in computer science. "There's a lot of precedent for interdisciplinary majors in the humanities, like American studies," he said, "but not so much in the sciences."

Maxwell was also thinking of a way to bring more students into the small and predominantly male Computer Science Department. Maxwell thought that if he could show how computer science could be applied to other aspects of life, he could attract more students from all academic divisions.

Interest was instantaneous. "This is where music is headed," said Associate Professor of Music Jonathan Hallstrom, for example. Hallstrom has experimented with electronically created music for years; one of his original compositions includes a score where two pianists trigger musical and video events. Hallstrom and Maxwell knew each other through orchestra (Maxwell plays violin), and the two talked extensively about the intersection of computers and music.

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> —Emily Post '15

In a document pitching the new major, Maxwell listed benefits of combining the computer science major with other majors and benefits for students applying to graduate school. "Students who have had depth in both CS and another discipline ... are able to act as a bridge between groups of people of different knowledge sets," he wrote. Interdisciplinary computation majors would take three foundational computer science courses and then take various required courses from one of four tracks—IC biology, IC theater and dance, IC music, and IC environmental science. Each student would also complete a senior capstone project.

The difference between the interdisciplinary computation majors and simply doing a double major in computer science and biology, for example, was that the IC major would give students a more integrated experience, Maxwell argued. Students would learn how to apply computer science to their specific field rather than learning unrelated computer skills. In addition, the course load for one IC major would be more manageable than a double major, which might permit an additional major or a minor.

The computational knowledge IC students receive gives them specialized research opportunities. Associate Professor of Environmental Studies Philip Nyhus worked with the first IC environmental science major, Sola Zheng '17, last summer to monitor the effects of deforestation on tigers on the island of Sumatra, Indonesia. "[Zheng] was able to draw on her computer science background to understand the software and the environmental science background to understand the issue," Nyhus said. "This made it possible to do more-advanced and more-original research, which otherwise might be only feasible with graduate students."

The same is true in the non-science IC majors. Adjunct Associate Professor of Theater and Dance Jim Thurston works with students to incorporate computer technology onstage. "I can teach them about scenography and performance," said Thurston, "but they can teach me about computers and how to bring my visions to life."

The result has been stunning. Last year *Orlando* featured student-designed projections of changing lights and architecture that responded to the movements of actors on stage. Similarly Assistant Professor of Theater and Dance Annie Kloppenberg choreographed a new work called *Crazy Lonely Yellow* featuring projections that heightened the feeling of being locked in a room. Across campus IC music students help Hallstrom push the boundaries of composition: "I often use these students as research assistants to help me with issues I come across," he said.

Numbers of IC majors are still small—three students graduated last year and 14 are currently enrolled, with IC biology the most popular track. It takes a very special student to take on an IC major, Maxwell said. "With a traditional major, students often think they know what to expect. If it's brand-new, they often wonder 'What is my career path going to look like?' How will employers know what it is?'" he said.

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Students who made the leap found the major boosted their career prospects. Adam Lavertu '16, an IC biology major, analyzed the gene profile of algae to investigate coral bleaching. "That experience showed me how powerful computation could be," Lavertu said. "Biology has always been really qualitative, and it's interesting to see how you can take computers to make sense of all the data."

Lavertu says the IC biology major opened up opportunities he would never have had otherwise, like a Jan Plan on bioinformatics—the science of using computer science, statistics, mathematics, and engineering to analyze and interpret biological data. Lavertu is exploring internship and career opportunities with the Jackson Laboratory in Bar Harbor, Maine, a research institution investigating genomic solutions for disease.

Similarly, Emily Post had no problems finding a job after her stint in Vegas. This fall she set sail with Carnival Cruise Ships running a multimillion dollar system for the line's onboard shows. Cruise ships, she said, are a sought-after training ground for anyone who wants to break into the technical side of the entertainment business. "Working for Carnival has been an amazing experience so far," Post wrote in an email from Aruba, where the ship was docked. "I'm lucky enough to be able to do the work I love and have the ocean waiting just outside the stage door."

Looking to the future, Maxwell says he hopes to open a new track in economics, provided the Computer Science Department has the capacity. In a sign of our times, the department has gone from being one of the smallest on campus to one of the largest science departments in terms of declared majors. About a third of students now take a computer class before they graduate. "That's the advantage of a liberal arts college," Maxwell said. "We can take advantage of the interdisciplinary nature of the College to make computer science real with real-world applications."

Emily Post '15 works at the console at Stagecraft Institute of Las Vegas, Nev. Post brought computational skills learned at Colby to top-flight theater training.