David Joyner

Regents' Teaching Excellence Awards for Online Teaching

Nomination Packet

Table of Contents

Reflective Statement

In my approach and experience, the essence of teaching online is in the subversion of traditional functional roles. We discuss in teacher training and learning science research the value of a student-driven classroom, and there is no shortage of documented approaches for subverting the traditional "sage on the stage" model for students' own benefit. However, in practice, it is always difficult to get past the assumption on the part of students that the instructor is present to be the authority. Even setting aside the structural incentives for students to view the classroom as the instructor's dominion, it also requires a unique confidence and personality to host a nontraditional classroom.

The online environment, in turn, is wonderful and terrifying in that it effectively enforces the subversion of those traditional roles. The classroom environment, typically asynchronous and forum-driven, is inherently stacked in favor of the students: it structurally affords students seizing greater influence. In my conversations with professors as a mentor for new online instructors, this is often the key experience they recount after their initial semesters: that the students are much more self-regulated. Having had the same experience with students in my online undergraduate class, however, I feel that this is not just unique to the online student body: rather, the online interface allows students to demonstrate greater influence over their own education.

This is, for me, the key philosophy of teaching online: embrace the greater control and influence the online environment gives to students. Find ways to build greater connections among students. Have them review one another's assignments, and share with them the class's best work. Encourage and incentivize them to help each other, and build collaboration policies that leave them comfortable doing so. Embrace their ability to determine some portions of class content for themselves. Participate in the discussions that they start. Be transparent about the course design, and seek feedback on whether it is accomplishing its goals.

These are good goals to have on campus, but they are difficult to all accomplish in three hours a week while needing to *also* present the actual course content. Online? The classroom is open 24 hours a day. Instructors and students are not competing over a highly limited amount of time. Student-posed discussions do not detract time from necessary course content. Student answers to classmates' questions are not out of place. Student critique of the course structure or policies is not as inherently confrontational.

Over the course of my 28 class-semesters teaching online, I have developed several strategies for incorporating this philosophy into actual course components. My classes have participation policies that have been carefully refined over several semesters: instead of the typical "post X times" or "review X classmates", students are provided multiple routes to earn credit in the way that is most compatible with their skillsets. Direct incentives are built-in for answering classmates' questions or reviewing peers' work more rapidly to get students quicker feedback. We share a thread all semester long that actively encourages students to critique and correct the course, and request feedback at four different points to ensure students do not forget their impressions by the end of the term.

All of these functions and more follow the overall philosophy that the power of online education lies not just in its flexibility, accessibility, and affordability, but also in its power to put students in charge of their own—and their classmates'—learning experiences. It is our goal to turn classes into communities, classmates into contemporaries, and students into scholars of their own education.

Teaching Artifacts

Below are brief descriptions of three teaching innovations employed in Dr. Joyner's classes.

Innovation #1: Project-Based Learning Online at Scale

A common criticism of online learning is that while it may be able to replicate assessments like multiple-choice exams, it struggles with truly open-ended project-based learning. Dr. Joyner's CS6460 class was developed in 2015 to address this concern. The class is entirely project-based, with no automated evaluations, no synchronous activities, and no significant video presence. Rather than watch videos and take assessments like a traditional online course, students investigate the literature.

Of specific note are these unique innovations of the course's design:

- **The mini-PhD structure.** Students open the semester researching existing literature on a topic they find interesting. They then complete a 'personal question' reminiscent of a qualifier question in PhD programs. They then write a proposal for what they will complete for the course project, and in the end, present a paper and a presentation covering the project they completed.
- **The mentorship structure.** Throughout these steps, students are partnered with a mentor who evaluates all their course assignments and gives them feedback; in this way, the mentor develops a long-term familiarity with the student's work, and the grading process is a conversation between the two.
- **The self-proposed projects.** Just as no two dissertations are alike, no two student projects are alike. Rather than assigning all students the same project to complete, students propose their own project. The project may be on one of three tracks: development (creating a new tool), research (investigating a phenomenon), or content (teaching some material).
- **The resubmission policy.** Because assignments are intended to be a conversation between the student and their mentor, we see no need to have formal, final grades: if the student is lacking in a certain area, then they should address that area, and if they do, their grade should be changed to compensate. So, all students are permitted to resubmit any assignment that receives less than an A, and mentors are also free to give students leeway to raise their grade.
- **The participation policy.** Participation in online courses is often inauthentic as students post merely to meet post count requirements. The participation policy for CS6460 gives students multiple avenues to earn their participation credit: helping on the course forum, completing peer reviews, participating in classmates' projects as testers or survey-takers, etc. Without videos, CS6460 relies on student conversations and interactions to create the class experience, and the participation policy provides ways to support multiple types of students.

Further information about the online version of CS6460: Educational Technology can be seen at the publicly viewable syllabus: omscs6460.gatech.edu.

Innovation #2: Dynamic, Revisable Pre-Filmed Lectures

A second common challenge among online instructors is that once a class is filmed, it becomes difficult to main and iterate the way one would do in a traditional class. There is significant pressure to get the initial lectures "right" as they will be reused for several years, and yet this is often an unrealistic goal: the field itself may change, students will give feedback on the course design, and so on.

In 2016, Dr. Joyner developed an online version of CS6750: Human-Computer Interaction. While CS6460: Educational Technology used nearly no video material, CS6750: Human-Computer Interaction invested significant time and energy into developing high-quality, highly maintainable video material. This was done with a focus on authoring short, individually self-sufficient videos averaging 2-3 minutes in length, such that inserting new material, removing material, or revising existing material is far easier.

For an example of this curricular innovation, we suggest looking at lesson 2.3 from the course. This lesson is accessible to the public here (though a Udacity account may be required). Human-computer interaction covers interaction in the real world, and so the course is filmed in several locations. Thus, the course was entirely pre-scripted, and the scripts have been made available to students here. Of particular note in the lesson is the rapid shift of contexts: the lesson is evenly mixed between screencapture slides, on-location shooting, and presenting in a typical studio.

The goal of maintainability has been realized within the course as well; this year, Dr. Joyner filmed 10 new videos to insert into the course, and was able to do so without fundamentally altering any of the existing material. This presents a major advantage compared to traditional maintenance of 40-minute video lectures, which demand either refilming the entire lesson or awkwardly splicing in new material. The course syllabus may be found at omscs6750.gatech.edu.

Innovation #3: MOOC-Style CS1 For-Credit Online

In 2017, Dr. Joyner launched his third course and the College of Computing's first online undergraduate course: CS1301: Introduction to Computing. CS1301x can be accessed with an edX account at bit.ly/CS1301x. Here, the course materials embody effective teaching strategies with lessons that interleave theory, demonstration, practice, and feedback.

To take an example, chapter 3.2 begins with shots of the instructor discussing the chapter's general topic. Interspersed between these videos are conceptual multiple-choice problems. Then, within the chapters of the lesson, the instructor walks through and hand-annotates code segments in a series of short videos. Again, interspersed between these videos are live coding exercises. All of these exercises give students live feedback on their progress so that they may decide whether to move forward, rewatch earlier material, or seek help. Students are also given a sandbox at the end of each lesson loaded with all code shown in the lessons' videos. This allows them to play around with the code they saw and see how different changes affect the output.

As part of the course, students also receive a free textbook built on McGraw-Hill's SmartBook platform. This textbook was authored by David Joyner to be congruent with the course material: its organization and content are the same, and the same examples, visuals, and analogies are present in both the book and the video lectures. This allows students to shift back and forth between video and text to suit their study habits or preferences; anecdotally, many students note that the textbook is great for 'perusing' and recapping, whereas the video lecture is better for initial consumption.

785 students have taken CS130x at Georgia Tech for class credit, while over 75,000 registered for the initial run of the MOOC; since it was split into four mini-courses, it has drawn an additional 67,000 registrations in only four months.

End-of-Course Evaluation Results

Below are a handful of selected comments from institute-run end-of-course evaluations.

- (CS1301, Summer 2017) The best aspect was the responsiveness and overall enthusiasm from the course instructor. It was apparent right off the bat his priority was to make sure each student understood the course material fully. For example, when I did not understand a certain explanation for a coding problem, he explained it two other different ways over office hours. I was initially nervous about taking an online course, but the professor constantly checked the class's online forum throughout the day, so I always received a response (early in the morning or even later in the day). Another example: I was struggling on a coding problem, so right before the test he sent out an email really breaking down the problem, providing explanations for certain aspects, that really helped my understanding and others. He was really able to work at students' basic level of coding knowledge, was down to earth, and very helpful.
- (CS6460, Summer 2017) It is obvious that Dr. Joyner is extremely knowledgeable as well as enthusiastic and engaged. I don't think I've had a course that allows this level of interaction with a professor. I had numerous 1-on-1 conversation with Dr. Joyner and he was great to interact with, he was very helpful and patient with all my questions and concerns.
- (CS6460, Summer 2017) Dr. Joyner is an education machine. I have learned a tremendous amount from him. His communication is unparalleled in the program. He is responsive to questions and obviously cares deeply about students and education. Dr. Joyner inspires me to learn and explore my interests. He is just an unbelievable guy. Thank you Dr. Joyner for all that you do. It is much appreciated sir.
- (CS6460, Spring 2017) Dr. Joyner's greatest strength is the time and effort that he puts in to every class that he instructs. I am very appreciative of his visibility and availability for students. His time and dedication is far above every other instructor that I had in all of OMS. He truly offers students in his courses a gift, not only in his excellent videos, but more so in his genuineness, care and concern for his students' success.
- (CS6460, Spring 2017) Dr. Joyner is the best instructor I have had in my 7 semesters here in the OMSCS (that doesn't mean that the other's haven't also been good). His passion for teaching is very evident in all his actions and the organization of the course. His greatest strength is the manner in which he treats his students.
- (CS6460, Spring 2017) Dr. Joyner made himself completely available to the students. For an online class, I did not realize a teacher could be so available. In fact, Dr. Joyner was definitely more available via Piazza and Slack than any professor I have ever had before, both in undergrad and grad school.
- (CS1301, Spring 2017) The instructor was always on top of things. If I had to picture him, I would see him at his computer 24/7 responding to students on Piazza, Slack, through email, etc. It was very impressive how quickly he would get back to us and it was incredibly helpful. I really appreciated that he made us a priority even outside of the "classroom".
- (CS6460, Fall 2015) If all of OMSCS blew up in a catastrophic end-of-all-days firestorm, as long as David Joyner survived it would barely qualify as a loss.

Below are scores on the institute's end-of-course surveys. All questions were given on a 5-point Likert scale. All surveys were run by Georgia Tech, and results were not provided to instructors until after the final deadline. Numbers shown are interpolated medians.

Course	Semester	Amount Learned	Course Effectiveness	Instructor Clarity	Instructor Respect	Instructor Enthusiasm	Instructor Availability	Instructor Effectiveness
CS6750	Summer '18	4.40	4.81	4.95	4.96	4.97	4.84	4.91
CS6460	Summer '18	4.45	4.78	4.84	4.94	4.95	4.84	4.92
CS1301	Summer '18	4.65	4.69	4.77	4.92	4.95	4.85	4.84
CS6750	Spring '18	4.65	4.81	4.95	4.95	4.98	4.90	4.95
CS6460	Spring '18	4.23	4.78	4.87	4.92	4.92	4.82	4.91
CS1301	Spring '18	4.77	4.85	4.90	4.95	4.96	4.91	4.91
CS6750	Fall '17	4.45	4.80	4.93	4.94	4.95	4.87	4.93
CS6460	Fall '17	4.45	4.78	4.90	4.94	4.96	4.87	4.90
CS1301	Fall '17	4.74	4.90	4.97	4.98	4.97	4.94	4.95
CS6460	Summer '17	4.12	4.69	4.82	4.92	4.93	4.88	4.88
CS6750	Summer '17	4.41	4.85	4.95	4.96	4.97	4.93	4.94
CS1301	Summer '17	4.91	4.86	5.00	5.00	5.00	4.91	4.95
CS6460	Spring '17	4.58	4.86	4.93	4.98	4.98	4.97	4.96
CS6750	Spring '17	4.45	4.74	4.92	4.96	4.97	4.89	4.95
CS1301	Spring '17	4.71	4.89	4.89	4.97	4.96	4.91	4.93
CS6460	Fall '16	4.28	4.68	4.85	4.91	4.93	4.85	4.89
CS6750	Fall '16	4.53	4.82	4.91	4.95	4.95	4.88	4.92
CS7637	Summer '16	4.10	4.46	4.78	4.90	4.92	4.79	4.85
CS6460	Spring '16	4.31	4.77	4.93	4.97	4.98	4.89	4.93
CS6460	Fall '15	4.36	4.79	4.87	4.95	4.97	4.86	4.93
CS7637	Summer '15	4.16	4.60	4.77	4.92	4.96	4.88	4.87

More information can be found by seeing the reviews for David Joyner's classes left at omscentral.com, an independent, student-run class review site for the online Master of Science in Computer Science program at Georgia Tech. Additionally, David was ranked by the survey software as among the best in school in all of the following categories: Considering everything, the instructor was an effective teacher; Considering everything, this was an effective course; Design project was a meaningful educational experience; Helpfulness of feedback on assignments; Instructor clearly communicated what it would take to succeed in this course; Instructor effectively answered students' questions; Instructor's ability to stimulate my interest in the subject matter; Instructor's availability for consultation; Instructor's clarity in discussing or presenting course material; Instructor's level of enthusiasm about teaching the course; Instructor's respect and concern for students; You learned a great deal in this course; You would like to take another course with this instructor.

The following abstracts from accepted papers are provided as evidence of rigorous assessment and teaching innovation.

From "From Clusters to Content: Using Code Clustering for Course Improvement", SIGCSE 2019

Large undergraduate computer science courses gather thousands of student code submissions per semester. With cloud computer labs, these are increasingly in standard formats and organizational schemes. To help make sense of the large quantities of submissions, projects have emerged to dynamically cluster student submissions by approach for writing scalable feedback, tailoring hints, and conducting research. However, relatively little attention has been paid to the value of these tools for informing revision to core course materials and delivery methods. In this work, we applied one such technology—Sense, the eponymous product of its company—to an online CS1 class delivered simultaneously for credit to on-campus students and for free to MOOC students. Using Sense, we clustered student submissions to around 70 problems used throughout the course. In this work, we discuss the value of such clustering, the surprising trends we discovered through this process, and the changes made or planned to the course based on the results. We also discuss broader ideas on injecting clustering results into course design.

From "Toward CS1 at Scale: Building and Testing a MOOC-for-Credit Candidate", Learning @ Scale 2018

If a MOOC is to qualify for equal credit as an existing on-campus offering, students must achieve comparable outcomes, both educational and attitudinal. We have built a MOOC for teaching CS1 with the intent of offering it for degree credit. To test its eligibility for credit, we delivered it as an online for-credit course for two semesters to 197 on-campus students who selected the online version rather than a traditional version. We compared the demographics, outcomes, and experiences of these students to the 715 students in the traditional version. We found the online students more likely to be older; to be underrepresented minorities; and to have previously failed a CS class. We then found that our online students attained comparable learning outcomes to students in the traditional section. Finally, we found that our online students perceived the online course quality more positively and required less time to achieve those comparable learning outcomes.

From "The CHI of Teaching Online: Blurring the Lines between User Interfaces and Learner Interfaces", In *Designing for the User Experience in Learning Systems*

The growing prevalence of online education has led to an increase in user interface design for educational contexts, and especially an increase in user interfaces that serve a central role in the learning process. While much of this is straightforward user interface design, there are places where the line between interface design and learning design blur in significant ways. In this analysis, we perform a case study on a graduate-level human-computer interaction class delivered as part of an accredited online program. To evaluate the class, we borrow design principles from the HCI literature and examine how the class's design implements usability principles like equity, flexibility, and consistency. Through this, we illustrate the unique intersection of interface design and learning design, with an emphasis on decisions that are not clearly in one design area or the other. Finally, we provide a brief evaluation of the class to endorse the class's value for such an analysis.

Georgia Tech College of Computing

Zvi Galil, *The John P. Imlay Jr. Dean of Computing*

March 1, 2019

RE: Letter of Support for David Joyner

To the Selection Committee for the Georgia Tech Center for Teaching & Learning Teaching Excellence Award for Online Teaching:

This letter is in support of David Joyner for the Georgia Tech Center for Teaching & Learning Teaching Excellence Award for Online Teaching.

Since beginning work on online education in 2014, David Joyner has become one of Georgia Tech's foremost experts in both teaching online and in researching online learning. As a teacher, David has taught over 7,000 students enrolled in the five classes he has taught online. This term alone, enrollment in his classes tops 1300 students.

In 2014, he co-created the OMSCS version CS7637: Knowledge-Based AI with Ashok Goel, and in 2015, they together completed the OMSCS programs' first rigorous evaluation of learning in the program, which was published in the International Journal of Scholarship of Teaching and Learning. In 2015, he created the OMSCS version of CS6460: Educational Technology, an experiment in teaching a heavily project-based class with almost no video material which has gone on to be one of students' favorite courses in the program and generated numerous student-written peer-reviewed publications. In 2016, he created the OMSCS version of CS6750: Human-Computer Interaction, an experiment in filming a video-based class across many locations with an eye towards maintainability.

Despite the size, David also has the reputation of being one of the OMSCS program's most involved and hands-on teachers. His CIOS reviews are routinely exemplary, and students regularly comment on how smoothly his classes run, and on how his passion for both the subjects and online education as a whole shine through.

In addition to teaching three classes in the online Master's program, David also created Georgia Tech's first online computer science. The online version of CS1301: Introduction to Computing is taken by computer science, industrial systems and engineering, business, and several other majors across campus. The course was offered to on-campus students for course credit.

Knowing that online courses can often actually offer inferior experiences when insufficient resources are devoted, David was also adamant about building the course from the ground up to take advantage of what online education can do. As a result, his CS1301 offering has proven to be the best that online education can offer. The course is built around almost 500 videos averaging 2 minutes in length each, rapidly interleaved with over 1,000 live practice problems. Students have the flexibility to pace themselves as they move through the material, pausing and seeking help when they're confused rather than getting lost as the course moves on without them. The course design is a master class in how to create a course that takes advantages of the opportunities of teaching online.

Two years later, the results of the course have been spectacular. For the first three semesters, a rigorous evaluation showed that students in the online course learned just as much as students in the traditional course. In Spring 2018, students in the online course actually outperformed students in the traditional course, learning even more as measured by a standardized CS1 concept inventory. On top of that, students in the online version reported that the student experience in the online course was

far better than traditional courses they had taken. They reported learning as much material as the traditional section, but in significantly less time per week with lower stress. And despite being an online course, many of them reported that they felt David was more attentive and invested in their success than any of their other instructors, sending weekly reminders to students who fell behind the recommended pace and typically answering questions on the course forum within minutes.

Perhaps most remarkably, the course was built to also function as a MOOC. To date, almost 70,000 students have enrolled in an identical public offering of the course on edX. This stands in contrast to years of failures in online education. Most prior experiments comparing MOOCs or other online offerings to in-person experiences found that the online alternatives were far worse, but David's CS1301 course has succeeded where many others have failed.

In addition to his role as a teacher in these online programs, David has also become one of the field's foremost researchers in the area. He has published four full papers in the ACM's Learning @ Scale conference, the predominant venue in the area with a selective 22% acceptance rate, as well as two book chapters, an article for AI Magazine, as well as a dozen other papers in venues like AI in Education, the symposium on Educational Advances in Artificial Intelligence, the Conference on Computational Creativity, the IEEE Conference on Learning with MOOCs, and the ACM SIGCSE annual conference. He was also awarded a gift from Mozilla to explore using virtual reality in online education, and is a co-PI on a grant from the NSF to investigate detecting student affect and emotional response to deliver individualized online lecture material.

For the last four years, David has been at the forefront of innovative online curriculum development, both as a teacher and as a researcher. His work with CS1301 especially stands out as among the most impactful educational technology initiatives in recent college history.

Sincerely,

Zvi

Pamela K Buffington
Georgia Institute of Technology
pam@gatech.edu
Jan 30, 2018

Dear Evaluator:

I am writing to strongly recommend David Joyner for the Teaching Excellence Award for Online Teaching. As the Associate Director of Academic Technology for OIT and the Director of Faculty and External Engagement for C21U it has been my distinct pleasure to work closely with David over the past few years. During this time we worked together to create CS1301, GT's first undergraduate computing course that is wholly online, as well as multiple courses in the Online Masters of Science in Computer Science (OMSCS). David has an unrivaled passion in delivering superb quality and innovative CS courses to all students and has always gone above and beyond in everything he does. He is driven to provide a highly interactive experience for students of all levels in multiple technologies and methods to best meet the students' needs continually ensuring that all their questions and concerns are answered promptly.

While developing CS1301 David worked incredibly hard ensuring that the course design would meet the needs of students at a variety of levels. He personally developed more than 400 videos to present the course content in manageable chunks. In addition to this, he worked with McGraw Hill Education to create an online interactive textbook. He researched vendors to enable students access to an online programming environment without needing to install anything on a local computer which also enables immediate feedback for the students to effectively learn from their mistakes in real time. Finally, he integrated this programming environment with his online proctored exam process.

David Joyner is an amazing innovator who takes time to research and understand the field, listen and understand any improvements his students offer and using research techniques to ensure that his innovation is effective and supported by quality data that is then reviewed by peers.

I can not imagine a more qualified and passionate candidate for this award. David is a delight to work with and is a prime example of innovation at Georgia Tech.

If you would like additional information about David, you can telephone me at (678) 992-9205

Sincerely,

Pamela K Buffington

Pamela K Buffington

Associate Director of Academic Technology :: Office of Information Technology
Director Faculty & External Engagement :: Center for 21st Century Universities

AUGUSTA
UNIVERSITY

November 15, 2018

To: Selection Committee for the Georgia Tech CTL Teaching Excellence Award for Online Teaching

Re: Dr. David Joyner

Members of the Selection Committee:

I am honored to provide a letter of recommendation on behalf of Dr. David Joyner in support of his nomination for the Georgia Tech CTL Teaching Excellence Award for Online Teaching. I feel as though I am in a somewhat unique position to judge Dr. Joyner's abilities and performance as an online instructor, and so I hope you find the information herein useful in your selection process.

As background, I've been a faculty member at Augusta University now for over 13 years. Although my professional and educational background was in computing, my undergraduate and doctoral degrees are in Business. So, when Georgia Tech announced the creation of their online Master's in Computer Science, I felt it would be a great opportunity to further hone my theoretical understanding of the Computer Science discipline and add to my academic credentials. I was in the inaugural class for the program and was, frankly, quite skeptical that it could provide an educational experience that could compare to a face-to-face graduate program.

My first few courses were of high quality, but I still felt as though the online experience was lacking something. I was learning, but I never really felt all that "engaged" by the instructors or the instruction. However, when I took my first course that was designed and run by David, and my eyes were opened to the true possibilities of online course delivery. This was perhaps partly because of the topic

School of Computer and Cyber Sciences

Mailing Address:
1120 15th Street, AHN108
Augusta, Georgia 30912

Office Address:
2500 Walton Way, Allgood Hall
Augusta, Georgia 30909

T 706-729-2372
F 706-667-4538

augusta.edu

(Educational Technology), but mostly it was because of the way in which the course was designed and delivered by Dr. Joyner.

In this course, David's video lectures were very professionally done, but they were not a major component of the course delivery. Instead, they were intended simply to introduce topics and to guide the learner down a path of discovery. And as with a good, face-to-face graduate class (and unlike many other online courses), most of the learning occurred through this process of self-discovery, through discussion with instructors, mentors and peers, through peer reviews and via project-based learning. I was very impressed. Online learning was no longer simply a recorded "sage on a stage" followed by graded exams and projects, but instead was a truly engaging, active learning experience.

From there, I actively sought out and took each of David's courses (three of them—an amazing fact in its own right). And though I felt that most of my learning experiences at Georgia Tech justified my investment, David's were special and memorable.

The final course that I took from David, Human-Computer Interaction (HCI), I believe was the third one that he created for the OMSCS program. And it was apparent that he had incorporated lessons learned from his first two courses, as it was easily the most engaging, most well produced, and most well delivered course that I took during my time in the program. I would probably go further and say that it was among the best overall courses that I have taken in my entire academic career. In fact, I flipped roles and taught an undergraduate HCI course here at Augusta University based in large part on his course. I'm not an HCI expert and have never had any strong affinity for it, but David made me love it. And did so entirely mediated by technology—a task I had previously thought improbably if not impossible.

As with most institutions attempting to scale the delivery of instruction and increase flexibility without dramatically increasing delivery costs, AU has been actively working to move more and more courses online. Last Spring, I was very excited to invite David to our campus to deliver a keynote presentation and proctor workshops for our faculty and staff designed to help us improve the design and delivery of our nascent online offerings. To my knowledge, we have created at least two courses incorporating many concepts drawn from his experience in online education. And they are much better for this. Perhaps more impactful, though, we've been able to incorporate many of his ideas into a few of our hybrid and face-to-face offerings. As recently as last week, I had one of the attendees of the workshops tell me how he had leveraged one of the concepts David had presented into one of his courses and

how well it had been received by his students. Good ideas for good instruction from good instructors will transcend institutions and delivery modalities.

I am not certain what qualities you will focus on in determining your selections for this award. However, if they include course design, lecture scripting, lecture delivery, video production, attention to detail, assignment design, student engagement and outreach, quality of communication, passion for instruction and compassion for students, I cannot think of a more deserving recipient for such an award than Dr. David Joyner. If you have any additional questions about my experiences with David, I would be more than happy to share them.

Sincerely.

– PTY –

Paul T. York, PhD
Asst. Professor and IT Program Director
School of Computer and Cyber Sciences
Augusta University, Augusta, GA, USA

Angela Smiley
11311 NE 128th St.
Kirkland, WA
98034
D202

To whom it may concern,

I've learned from Dr. Joyner in various capacities (sometimes student, sometimes TA) for about three years. You wouldn't think that's a long time, but yet I feel I know him very well. That's because - like many students in the OMSCS - after having him as head TA in CS7637, I decided to follow him around and take any other classes he offered.

In creating my program, Georgia Tech took on a great risk in hopes of a great reward. The risk is that any lapse in instructional quality will stain Georgia Tech's reputation as a top 10 CS school; the reward will come when the innovations pioneered in the laboratory of OMSCS can be distilled for use on the main campus and in the world at large. In the last year, no single instructor has contributed more to its instructional quality - and to gleaning best practices - than has Dr. David Joyner.

He began by taking over as the instructor for CS7637 during the Summer 2015 term, when the usual instructor was unavailable. That offering of CS7637 set an enrollment record for the program, so simply volunteering to teach it was a great service. Dr. Joyner went beyond that, though, by successfully addressing some challenges which had resisted solution in previous semesters. (E.g., motivating greater use of visual methods and rewarding experimentation in the early projects.) Several students remarked that despite the 300+ enrollment it had the feel of an intimate seminar due to Dr. Joyner's omnipresence in class discussions.

Genuine excellence as an instructor requires not just the highly visible work of teaching in class but also the almost-invisible work of mentoring individuals and working behind the scenes to strengthen the institution. Dr. Joyner has embraced all these tasks, not just the glorious ones. He has consistently found time to offer guidance to his students outside the formal bounds of the classroom, particularly to those researching more effective ways of guiding a class and fighting plagiarism (two areas that feed back into the quality of education for all). He was also the leader in selecting and mentoring TAs from the OMSCS program itself. This helps to further the financial stability of the program and to free up on-campus TAs for on-campus classes, but more importantly, expanding the pool of TA candidates raises the bar for their performance and directly improves the student experience in *all* classes, not just his own.

In addition to his great work in KBAI, Dr. Joyner pioneered the OMSCS offering of CS 6460: Educational Technology. This was no mean feat: the on-campus counterpart revolves around in-classroom discussion, and relies heavily on individualized attention and feedback. In short, it

offers the kind of experience that few professors could replicate (or would even think to replicate) in another setting.

Dr. Joyner's reimagining of the course is one of the most popular offerings in the program, and it's already an indispensable part of the degree for students who have an interest in learning to do research. I know that I, personally, could never have been admitted to a Ph.D program or joined a lab without the experience I gained here. And other students agree; I think this comment from a course review sums it up well:

"The instructor is Dr. David Joyner, of KBAI fame, and he is extremely active on Piazza, keeping the class lively and engaged, which is no mean feat since we are all doing different projects. The final coursework is not done, so I can't comment here how it will all end, but so far it is a joy to be part of this particular environment. It is different from other courses." (https://omscentral.com/reviews/6460)

Dr. Joyner didn't stop with EdTech; he created another acclaimed "OMSCS edition" - of CS6750, our Human-Computer Interaction class here at Tech. Some quotes from the rave student reviews on https://omscentral.com/reviews/6750:

"The lecture materials were excellent. Communication with the professor is great. The assignments were thought provoking and interesting. One of the best courses in the program."
"The Piazza for this course was the most active and interesting of the courses I've taken."
"Favorite OMSCS class so far."
"I think everyone that designs computerized products should take this course."

Pause for a moment and look at that last comment. Over and over again I've heard OMSCS students across specializations echo that sentiment - that everyone who's involved in design (or wants to be) should take Dr. Joyner's course.

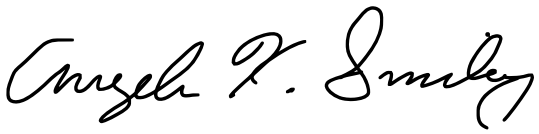
Why such a strong endorsement for a class that isn't (officially) required? HCI shows the same care, engagement and attention to detail as EdTech, but it's otherwise very different: rather than building a support system for research, HCI is laser-focused on giving students a toolbox they can take with them into their career - and use whenever there's an opportunity to evaluate and improve designs. For anyone who works in software, these opportunities are key; they often make the difference between life and death for a product. Of the many courses I took during OMSCS, it was the most immediately applicable to my work in software, and with each passing year I'm more glad to have taken it.

Most recently Dr. Joyner has pioneered yet another sort of online course: Georgia Tech's Introduction to Computing Using Python on EdX (1301x). This MOOC began its life targeted to Georgia Tech undergraduates, but it was quickly discovered by other students in other programs. Online Master's in Analytics students, in particular, have come to rely on it as a crash course in programming for those who don't have a CS background… and over and over again, I've heard them cite it as their exemplar of "online teaching done right." They comment

on the interactive textbook and other technological innovation, but most of all, they point to Dr. Joyner's unrivaled teaching and course design skills.

More than anything else, CS1301x showcases Dr. Joyner's rare combination of technological aptitude, pedagogical brilliance, and dedication to continued improvement for even the most successful courses. Lacking one of those qualities, one might not know about the latest research in cognitive tutors; or one might add them to the course, but without a clear argument for how they will affect it. Dr. Joyner is the rare instructor who includes new technology, insists that it materially improve the student experience, *and* has the wherewithal to make it so. These three qualities combined in one person make him a rare gem.

Sincerely,



Angela Smiley

To whom it may concern:

I wish to nominate Dr. David Joyner for the CTL Teaching Excellence Award for Online Teaching.

I am a former student of Dr. David Joyner's edX CS1301x Intro to Computing with Python. Through the MOOC, Dr. Joyner has made unparalleled contributions to Georgia Tech's undergraduate computer science community. With the growing popularity of learning computer science comes issues with overcrowding in traditional classroom settings, and Dr. Joyner's course is the most viable solution to this problem.

Aside from sustainability, it is also an innovative solution that seeks to challenge how computer science concepts are currently taught and delivered to students. More specifically, Dr. Joyner's course is innovative in that it addresses and practically applies many educational technology research methodologies such as instructional scaffolding and transfer. As a student, it was immediately obvious how much thought Dr. Joyner put into building the course to increase students' engagement and understanding of Python.

As I am almost halfway through college, Dr. Joyner's CS1301x course remains as the coolest course I have taken at Georgia Tech. In view of his distinguished career and dedication to bettering education on an infrastructural level, it is only the most appropriate to award the CTL Teaching Excellence Award for Online Teaching to Dr. David Joyner.

Sincerely,

Nina Qin

Georgia Tech Class of 2020

Industrial Engineering

November 18, 2018

Dear Georgia Tech Center for Teaching and Learning,

I am delighted to recommend Dr. David Joyner for the "Teaching Excellence Awards for Online Teaching". I have had the opportunity to work with Dr. Joyner both as a student in three of his courses, as well as in his role handling the teaching assistants for the Online Master of Science in Computer Science (OMSCS) program at the Georgia Institute of Technology.

I took three courses from him:

- CS6460 Educational Technology (Spring 2016)
- CS7637 Knowledge Based Artificial Intelligence (Summer 2016)
- CS6750 Human Computer Interface (Fall 2016)

My experience working with Dr. Joyner has been exemplary. In addition to being an extremely intelligent instructor, he is also remarkably talented at communicating and working with students. His courses, without a doubt, are the best executed courses that I had the privilege of taking in the OMS program – which is high praise indeed given the very good instruction provided by the program.

One thing that stands out for me with his classes is that while taking them there is a sense that nothing is overwhelming – the flow of his courses is brisk but uniform, his expectations are clearly laid out, his feedback clear and lucid. When issues arose during the execution of the classes, he quickly adapted to the changing circumstances in a way that demonstrated strong professionalism, flexibility, and a dedication to providing the best instruction possible. When the courses were done and I looked back at what I had learned, I was astounded at the sheer amount of information that I not only learned but retained. I have certainly had classes in which just as much material was presented, but in a less well-structured fashion, which I found leads to poorer retention. Thus, I found his courses to be highly valuable. I have recommended, and continue to recommend his courses to students in the OMS program.

Working with him in my capacity as a teaching assistant, I have found him to be easy to work with, highly approachable, diligent, and ultimately concerned about the well-being of the program TAs as well as the students in the program.

Since graduating from the OMSCS program, I have collaborated with him on our SIGCSE 2019 paper "Collaboration versus Cheating: Reducing Code Plagiarism in an Online MS Computer Science Program." His assistance in this collaboration was instrumental in the paper's acceptance in a pre-eminent conference in Computer Science Education.

One final observation on the value of him as an instructor: the Educational Technology class helped me realize the sheer joy that I found in doing research, in explaining concepts and materials from my own field to others, and ultimately encouraged me to continue on to pursue my PhD, which I am now doing at the University of British Columbia. His Human Computer Interface class inspired, albeit indirectly, my research direction in semantic file systems. No other instructor in the program did more to encouraging me to pursue further education than Dr. Joyner.

Thus, without reservations, I am happy to recommend him and his work to you as worthy of receiving your recognition for the amazing contributions he has made to Georgia Tech and to the entire USG system.

Regards,

William Anthony Mason

Subject: Nomination for “Teaching Excellence Awards for Online Teaching” (2018 - 2019)

To Whom it may concern:

It has been an honor to have prized guidance from Dr. Joyner, without which graduating from as rigorous curriculum as OMSCS from Georgia Tech would have been very difficult. I am not the only one who was personally touched and encouraged to achieve academic excellence by Dr. Joyner nor I believe will be the last one. He has a unique way of discovering best in a student through innovative and methodological structure followed by imparting innovative learning experiences including meaningful and rewarding student’s engagement.

The inventive learning experiences provided by Dr. Joyner to name few but not limited to are: “peer feedback”; “exemplary paper”; “reflection paper development”; “qualitative contributions and engagement with fellow students”; “personalized & interactive welcoming students in online environment”; one-on-one mentor-mentee relationship; developing research interest in students; giving full degree of freedom for development of open-ended advance technology ideation and its realization through methodological and incremental framework; leading, mentoring and guiding army of TAs to impart best academic practice to huge student base of OMSCS while maintaining grading consistency; taking advantage of cutting-edge technologies to develop curriculum, assert ingenuity of each & every students, enforcement of student integrity; interfacing with external world of academics such as journals, seminar and others to further student’s development; and many others.

I had taken 3 classes under him starting with “Knowledge-Based Artificial Intelligence” in summer 2015, which was a turning point in my career, academic, and life. The novelty of this class was to impart best learning experience of a very difficult and subjective class of giving the landscape of advanced technology like AI and by asserting student’s understating of the science behind the subject beyond imparted in the classroom. Second one was Educational Technology, where I was encouraged and closely mentored to developed “Electronic Learning record”. This research paper defined the framework for developing standards with which an individual learner of all categories including life-long can express his/her formal, informal and non-formal learning in a standardized and credible manner to a wide variety of stakeholders for personal, economic, education and training development. This paper was selected for further development as part of my 3rd class directly under the guidance of Dr. Joyner. This is where I was exposed to his deep subject matter expertise in research and paper development, which not only shaped the direction of paper but also shaped my thinking process in general for time to come.

The student community of Georgia Tech is very proud to have Professor Joyner as their guide, mentor, and philosopher. With growing popularity & demand of OMSCS along with complexity & challenge of keeping up with advanced technology, we always look forward to supporting his noble cause at every opportunity.

Best regards,

Susanta K Routray

908-433-5622

Senior Software Developer, AT&T Lab

Head TA CSE6242 (Data Visualization & Analytics), Georgia Institute of Technology

David Joyner, PhD
404-429-2380
david.joyner@gatech.edu
Georgia Tech College of Computing, 801 Atlantic Drive NW, Atlanta, GA 30332
Condensed Curriculum Vitae

EDUCATION

Georgia Institute of Technology College of Computing, Atlanta, GA	Ph.D. in Human-Centered Computing 2009 – 2015
Georgia Institute of Technology College of Computing, Atlanta, GA	Master of Science in Human-Computer Interaction 2008 – 2009
Georgia Institute of Technology College of Computing, Atlanta, GA	Bachelor of Science in Computer Science 2005 – 2008

RECENT EMPLOYMENT

Georgia Institute of Technology College of Computing, Atlanta, GA	Associate Director of Student Experience December 2017 – Present
Georgia Institute of Technology College of Computing, Atlanta, GA	Lecturer January 2017 – December 2017
Udacity, Inc. Mountain View, CA	Course Developer & Product Lead, OMSCS February 2014 – December 2017
Georgia Institute of Technology College of Computing, Atlanta, GA	Graduate Research Assistant August 2008 – January 2015
Georgia Institute of Technology College of Computing, Atlanta, GA	Graduate Teaching Assistant August 2012 – December 2012

RELEVANT TEACHING EXPERIENCE

CS7637: Knowledge-Based AI (Online)	Summer 2015 (370 students); Summer 2016 (370 students); Fall 2018 (463 students)
CS6460: Educational Technology (Online)	Fall 2015 (101 Students); Spring 2016 (126 students); Fall 2016 (130 students); Spring 2017 (150 students); Summer 2017 (189 students); Fall 2017 (228 students); Spring 2018 (208 students); Summer 2018 (205 students); Fall 2018 (253 students)
CS6750: Human-Computer Interaction (Online)	Fall 2016 (89 students); Spring 2017 (252 students); Summer 2017 (207 students); Fall 2017 (242 students); Spring 2018 (231 students); Summer 2018 (262 students); Fall 2018 (549 students)
CS1301: Introduction to Computing (Online)	Spring 2017 (59 students); Summer 2017 (27 students); Fall 2017 (138 students); Spring 2018 (213 students); Summer 2018 (116 students); Fall 2018 (232 students)
CSE6242: Data & Visual Analytics (Online)	Fall 2017 (464 students); Spring 2018 (591 students); Summer 2018 (349 students)

SELECTED PUBLICATIONS

Textbook	**Joyner, D. A.** (2016). *Introduction to Computing*. New York, NY: McGraw-Hill. ISBN 978-1-260-08227-2.
Magazine Articles	Goel, A. & **Joyner, D. A.** (2017). Using AI to Teach AI: Lessons from an Online AI Class. *AI Magazine 38*(2). 48-58.
Book Chapters	**Joyner, D. A.** (2019). Building Purposeful Online Learning: Outcomes from Blending CS1. In Madden, A., Margulieux, L., Kadel, R., & Goel, A. (Eds) *Blended Learning in Practice*. MIT Press.
	Joyner, D. A. (2018). The CHI of Teaching Online: Blurring the Lines Between User Interfaces and Learning Interfaces. In Kapros, E. & Koutsombogera, M. (Eds.) Designing for the User Experience in Learning Systems. New York: Springer.
Journal Articles	Goel, A. & **Joyner, D. A.** (2016). An Experiment in Teaching Cognitive Systems Online. In Haynes, D. (Ed.) *International Journal for Scholarship of Technology-Enhanced Learning 1*(1).
Conference Papers	**Joyner, D. A.**, Arrison, R., Ruksana, M., Salguero, E., Wang, Z., Wellington, B., & Yin, K. (2019). From Clusters to Content: Using Code Clustering for Course Improvement. In *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*. Minneapolis, Minnesota, USA.
	Mason, W., Gavrilovska, A., & **Joyner, D. A.** (2019). Collaboration versus Cheating: Reducing Code Plagiarism in an Online MS Computer Science Program. In *Proceedings of the 49th ACM Technical Symposium on Computer Science Education*. Minneapolis, Minnesota, USA.
	Joyner, D. A. (2018). Toward CS1 at Scale: Building and Testing a MOOC-for-Credit Candidate. In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale*. London, United Kingdom. ACM Press.
	Joyner, D. A. (2018). Squeezing the Limeade: Policies and Workflows for Scalable Online Degrees. In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale*. London, United Kingdom. ACM Press.
	Joyner, D. A. (2017). Scaling Expert Feedback: Two Case Studies. In *Proceedings of the Fourth Annual ACM Conference on Learning at Scale.* Cambridge, Massachusetts.
	Joyner, D. A., Ashby, W., Irish, L., Lam, Y., Langston, J., Lupiani, I., Lustig, M., Pettoruto, P., Sheahen, D., Smiley, A., Bruckman, A., & Goel, A. (2016). Graders as Meta-Reviewers: Simultaneously Scaling and Improving Expert Evaluation for Large Online Classrooms. In *Proceedings of the Third Annual ACM Conference on Learning at Scale.* Edinburgh, Scotland.
	Goel, A. & **Joyner, D.** (2016). Design of an Online Course on Knowledge-Based AI. In *Proceedings of the Sixth Symposium on Educational Advances in Artificial Intelligence.* Phoenix, Arizona.

AWARDS

Georgia Tech Curriculum Innovation Award	May 2018
Georgia Tech College of Computing Outstanding Instructor	May 2017
Georgia Tech Faces of Inclusive Excellence	September 2016
Georgia Tech College of Computing Lockheed Excellence in Teaching Award	April 2016
Georgia Tech College of Computing Dissertation Award	April 2016
Georgia Tech College of Computing Outstanding Graduate Teaching Assistant Award	April 2015