Geoffrey G. Eichholz
Faculty Teaching Award
Nomination Package
For

Mary Hudachek-Buswell, Ph.D.
Senior Lecturer
School of Computing Instruction
Spring 2024

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February 9, 2024

Dear Awards Committee,

It is my pleasure to nominate Dr. Mary Hudachek-Buswell for the Geoffrey G. Eichholz Faculty Teaching Award. Dr. Hudachek-Buswell is an Associate Chair and Senior Lecturer in the School of Computing Instruction (SCI) where she demonstrates leadership and teaching excellence at all levels of the undergraduate program. She has taught a variety of large (300+ seat) computer science courses, including general education courses such as Introductory Computer Science courses (Introduction to Computing, Introduction to Media Computation, Computing for Engineers), core courses for the Computer Science majors (Data Structures and Algorithms, Junior Project Design and Junior Project Implementation), elective courses (Data Manipulation for Science and Industry).

Dr. Hudachek-Buswell's CIOS scores are among the best in SCI. She is committed to excellence in the classroom, supports and inspires her students, and has worked tirelessly on her teaching pedagogy by attending and presenting at the premier conference on computer science education (Association of Computing Machinery's Technical Symposium in Computer Science Education) for years. She has been heavily involved in the SCI teaching assistant (TA) training program and, with CTL, developed a series of workshops for the TAs to attend as part of their training course.

As Chair of SCI, I am fortunate to have a forward-thinking Associate Chair who puts student experience first and acts on her ideas no matter how large or difficult they are to realize. Below, I will go into many examples of such cases while answering the core points that make Mary a well-deserving recipient of the Geoffrey G. Eichholz Faculty Teaching Award. Because her history of teaching excellence in core, general education, and/or introductory undergraduate courses is quite extensive, I'll highlight it throughout this letter.

Use of innovative strategies that specifically address the challenges associated with teaching core curriculum, general education concepts, and/or students who are new to higher education.

When the pandemic occurred during 2020 to 2021, Dr. Hudachek-Buswell's Data Structures and Algorithms course, CS1332, thrived. As part of the College of Computing's interest in online education, Dr. Hudachek-Buswell had developed an online version of the CS1332 course in 2019. This course was only the 2nd undergraduate online course to be developed within the College of Computing. Her CS1332 development occurred concurrently alongside a CS1331 online version by myself.

She redesigned the course by asking herself the question, "What do students need to see, if a video is all they have?" She created 117 videos on every topic in CS1332. She supervised the development of a visualization tool by TAs to assist the students with learning, https://csvistool.com/. The csvistool was featured in the

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Global Open Education Week (2021) and transforms students' ability to learn data structures and algorithms. She has incorporated knowledge checks, exploratory labs and extension problems. The online CS1332 was adapted to the edX platform as presented as a MOOC which launched in 2021. Class Central (an independent website that compares online courses at top universities) ranked her CS1332 as the Top Most Popular Course in 2021 and ranked 5th as the Best Data Structures & Algorithms course sequence in 2023.

Evidence of ability to engage, challenge, and support students.

Dr. Hudachek-Buswell primarily teaches CS1332 for SCI. Data Structures & Algorithms is the course where students must understand the principles of programming, and not just memorize syntax or code. As such, it is a course that students find challenging; however, the college wants a certain amount of rigor in place to ensure that students really do understand how to program. Dr. Hudachek-Buswell engages the students in the classroom with polls and problems for them to solve, outside of the classroom she has knowledge check quizzes in Canvas that they are to complete prior to lecture. She challenges her students with LeetCode questions so they can truly understand how the structure or algorithm works. LeetCode questions are corporate technical questions that are asked of interviewees.

Dr. Hudachek-Buswell supports her students in many ways. She has adopted a flexible model for types of recitation that are offered to her students. There is the traditional content reinforcement recitation and a new live coding homework recitation. She goes the extra mile for her students but is always fair to all students in her course.

Dedication to student success and accessibility to all students, even those who were not performing well in the class.

The online course and MOOC are perfect examples of accessibility to all students. The videos are also made available to the in-person campus sections. Dr. Hudachek-Buswell has comprehensive resources for CS1332 and is now looking at ways to help students navigate to which resources are best suited to their learning and questions. She listens to students' needs in learning and adapts her resources accordingly. CS1332 is required to be taken by all CS majors and it is the one course that does not have transfer credit. Thus, all students, whether major or minor, must pass through CS1332. Enrollment in the course runs **approximately 1100 per semester**. Dr. Hudachek-Buswell is invested in her students' success and growth in CS1332.

Impact on students' lives, both in and beyond the classroom.

Dr. Hudachek-Buswell has done as much for students outside of the classroom. She founded a scholarship to honor SCI TAs and had it fully funded in a year. She travels to the west coast to visit alumni TAs who are now software engineers at big tech companies. She has even attended their weddings. She has created a network of alumni TAs helping current TAs and students prepare for jobs at various corporations. Her outreach to a rural elementary school has made a meaningful impact for the children and teachers at the Willis Road Elementary School in Sharpsburg, Georgia within the Coweta School District. It has also helped to bring out the best in many of her undergrad TAs who helped with this philanthropic activity.

Commitment to undergraduate instruction.

Dr. Hudachek-Buswell consistently demonstrates extraordinary excellence in teaching, and she leverages multiple technologies and strategies to support student learning to meet the needs of all students. As an educator in the computing introductory and required core courses, she is an innovator who has developed tools and activities that specifically address the challenges of large-enrollment, core courses. She uses collaborative in-class polls and problems to make the large classroom "smaller," allowing every student to ask questions while working through course concepts. She is committed to undergraduate instruction and enjoys working with her students.

Good Georgia Tech citizenship.

All the examples above illustrate her good Georgia Tech citizenship. However, she serves on many institute, college and school committees. She also developed a spreadsheet tool for the GT baseball coaches to optimize their players' scholarship offers. She has judged many Hack GTs, organized the Junior Design Expo, and assisted with creating a teaching schedule for SCI.

Dr. Hudachek-Buswell's excellence in teaching is evident through her efforts in the classroom, her curricular innovations, her engagement of students in the classroom, and her direct impact on the students both in and out of the classroom. She is committed to teaching excellence and student success. She is the ideal candidate for the Geoffrey G. Eichholz Faculty Teaching Award, and I am pleased to nominate her for consideration by the committee.

Sincerely,
Fisayo Omojokun, PhD
Chair, School of Computing Instruction
College of Computing
Georgia Institute of Technology

Approach to Teaching

Education is the foundation upon which we can improve our global society and quality of life. Georgia Tech students are the future of our world. They will be the next generation of engineers, scientists, analysts, educators, researchers and leaders. It is my mission as an educator to positively influence every student, and provide engaged learning that stimulates their curiosity. I want to reach out to those who struggle, inspire those who wish to excel, foster critical thinking, and promote teamwork. I want students to develop an appreciation for problem solving, and articulate those thoughts in their code, written words and oral discussions.

When teaching introductory computer science courses, the material and skills in the courses are immediately applicable. In intermediate courses, the content is foundational for future learning. Upper level courses focus on the project experience. In all courses, I use different techniques to communicate the content to my students. My personal beliefs follow the constructivist learning theory where the individual learner actively constructs or creates their own subjective representations of information from prior knowledge. Thus, knowledge does not exist independently of an individual learner.

I provide my introductory course students with content scenarios that challenge them intellectually and require a higher order of cognitive demand. In intermediate courses, I strive for the students to solve more complex problems, and challenge them to think differently about the solution. In upper division courses, like the capstone sequence, I am a facilitator reminding them to use the good practices they learned in software engineering and apply it to their design and implementation of client's project.

Educational Activities and Innovations

I was tasked, by former Dean Zvi Galil, to create an online course for Data Structures & Algorithms, CS 1332, in 2018. I produced more than 117 videos from original content I developed, and not from a textbook. I approached the project from the perspective of the student, and focused on what did students need to "see" in order to understand the dynamics of different data structures and algorithms. The design of my course uses a diverse content experience with videos, comprehension quizzes, programming of elementary data structures, and in-depth exams. I wanted to ensure that the design of the material was inclusive and accessible to all students. I developed extension worksheets for all the topics so students could develop a deeper understanding of the concepts, and wrote pages of web content with illustrations, tables, and study tips for the online course.

What naturally followed was the development of a GTx MOOC version of the course in 2020-2021. During the pandemic, I embraced the opportunity to create new interactive components, as well as, enriched textual information that would assist all students in learning. This led to the creation of diagramming exploratory labs using a visualization tool that was developed for this course with a team of TAs. I also added extension content that I refer to as "Food for Thought" such as if the students learned about hashmaps and collisions, then I wanted to extend their learning to show how it is handled within different programming languages. The GTx CS1332 MOOC has received to awards from Class Central, a company that aggregates and evaluates online courses across the globe from many different platforms. The two awards are Class Central's "10 Best Data Structures & Algorithms Courses to Take in 2024" presented in April, 2023 for the Data Structures & Algorithms, four course, Program, GTx CS1332, which launched in January, 2021. Details here: https://www.classcentral.com/report/best-algos-data-structure-courses/ ;   and Class Central's

"Top 100 Most Popular Free Online Courses of 2021" presented in November, 2021 for my MOOC part 1 course, Data Structures & Algorithms I: Arrays, ArrayLists, & Linked Lists, which launched in January, 2021. Details here: https://www.classcentral.com/report/most-popular-courses-2022/ .

For the last 7 years, I have been working with the Junior Design committee to refine the capstone sequence, CS3311/CS3312. The course sequence is paired with technical writing courses, LMC3432 & LMC3431. We developed new criteria and assessments for the courses, and I was instrumental in shaping the Project Implementation Expo for this capstone sequence. The Expo replaces a written summary that the teams would previously do. The Expo requires an elevator pitch of the project, distributable collateral, presentation, banner/ad and table staging. The Expo has been extremely successful. Garnering the attention of many companies. The single goal of overhauling the capstone
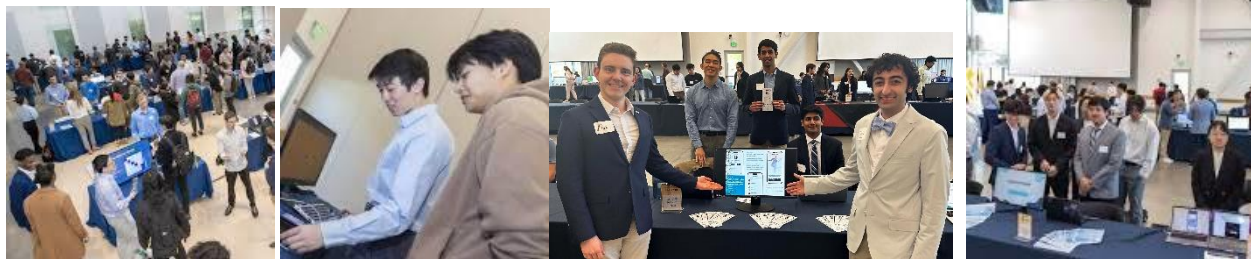
sequence was to move both courses towards the agile method of deliverables and focus on technical documents used in industry today. Using Canvas modules, the course was reorganized with deliverables retooled to be more agile. This redesign was immediately applauded by the students as it made more sense to them, and they were happy to see the older approach to deliverables replaced in their software engineering project.

Improvement from Student Feedback

I have a process of gauging my effectiveness where I spend time discussing what worked and what didn't work with my students in all my courses at different points during the semester. These discussions are illuminating and have helped shape my courses. I conduct anonymous start of term and mid-semester surveys. CIOS comments, class discussions and anonymous surveys have had a positive effect on my courses.

In 2016, CS1332 students wanted additional material to the textbook so I worked with a TA to create comprehensive slides based on my lectures. In 2017, I developed 45 mini "Reality Check" quizzes that count as a participation grade, and they are interwoven with the content so students can check their understanding. In 2018, students were requesting my lecture notes, so I assigned a TA to scribe my lectures. Students use the notes as a framework for their own notetaking, or when they may miss a lecture, or when preparing for exams. In 2019, I finished 117 prerecorded videos that are available to all students regardless of whether they are online or in-person students. In 2020, the students needed more information and ways to check their knowledge so I developed extension worksheets for each week of the course. We are currently, 2023/2024, rewriting the autograders for the homework programming assignments so that students get feedback on their assignment and they can correct/improve their program.

CS3311, Junior Design Part 1, the evaluation to improvement came when teams were developing prototypes for their designs. Prototypes have been in paper form up to this point. However, in 2020, after discussing the matter with students and their dissatisfaction with paper prototypes, I investigated technologies to create dynamic, digital prototypes. I introduced my teams to Figma, a platform for developing hifi digital prototypes. The teams were excited and the

clients were blown away by the prototypes. Digital hifi prototypes are now the norm across the capstone sequence.

CS3311/CS3312 allow faculty to work with some of the same teams over the course of two semesters. My discussions with students and CIOS comments revealed that teams were hindered in their overall progress by waiting to implement their project until the second semester. I made the decision that all CS3311 teams will implement some feature of their project prior to CS3312 to give them time to understand the technologies in their respective projects. The end result was a more robust product for clients. All teams in the capstone sequence are required to implement a feature of their project in the first semester.

Evaluating Effectiveness from Professional Development

In 2018, I felt there was a disconnect between the course and how the students were learning, and I wanted a positive way to move forward with the students. I had a CTL Consultant come to observe, gather information from my students and then meet with me to discuss ways I could change things in the course. This completely changed how I look at my students and provided an avenue with which to connect with my students. My CIOS scores have consistently increased since implementing these changes. I have continued that process on my own to be sure I stay connected with my students. I encourage my colleagues to make use of this service that CTL offers.

I strive to participate in multiple educational development workshops every year. I have found something valuable in each one that I can apply to how I teach or what I teach. At SIGCSE, I attended a session on ethics in computing. I was fascinated and have included an activity in my course. I ask the students to choose the method on how to solve a particular problem. After they discuss in groups, I reveal the ethical dilemma and ask them what would they do now that they have the full picture? The lecture comes alive with students talking. Many students have stated this is their favorite lecture.

Accessibility and Impact on Diverse Student Populations

In recent years, my focus has been on making content accessible to all students. For me, diversity is not just in population demographics, but in students' abilities to learn and what they require in order to facilitate their learning. I began working on multisensory instructional resources for students to interact with to gain a better understanding of the content in CS1332.

One particular student with major physical disabilities took my course a few years ago. Two topics were discussed in the meetings with this student: exams and visualization of dynamic content. For exams, I had to rethink how I write my exams and find other ways to get the information this student. As a direct result, I started asking my questions differently for all students. When it came to visualization, I supervised the development of a visualization tool that allows my students to see what happens real-time with data structures. The www.csvistool.com has changed how I teach my students. The CSVisTool is constantly being overhauled, updated and additional content added. This web app was featured in Global Open Education Week Featured "Data Structures & Algorithms Visualization Tool" – 2021 Details here: https://www.openeducationweek.org/resources/data-structures-algorithms-visualization-tool .

When the CS1332 online course launched, GTPE used a tool to create SRT files for closed captioning in the 117 videos. These same videos were uploaded and used in the GTx MOOC. It was brought to my attention by a hearing impaired student in the MOOC that the closed captioning didn't make any sense and the videos were useless the student. I was appalled and knew this had to be my next project in the path to accessibility to all students. The TAs and I began to rewrite the SRT files this past fall 2023 that GTPE produced in 2019. We are actively working with GTPE

to pinpoint the formatting issues that exist in the files. We have updated all the language so that it reflects what is being said in the videos. My hope is that we can complete this endeavor in 2024.

Illustrations of Teaching Excellence and Impact on Student Learning

Teaching Excellence in Core, General and Introductory Undergraduate Computing Courses

The last few years, I have mainly been teaching Data Structures & Algorithms, CS1332, and Junior Design capstone sequence, CS3311/3312. My CIOS scores consistently remain above 4.5.

CS1332 is considered an entry level course. It is the one course where we do not accept transfer credit. Currently, the enrollment in the course runs over 2700 annually. I was asked to ensure rigor in the course so that our students are competent in programming, as well as, create a learning environment where students can succeed. All the students had, years ago, was a textbook back in the days of T-Square. I have been developing educational materials and resources since I took over CS1332. The creation of materials began by talking with students, every semester, and asking them what do they need. My lecture is active with diagramming the movement of data in the structures and algorithms. The first resource was implementation slides for them to use outside of lecture. I had my lectures scribed so that the lecture notes were available to students outside of class. And so much more. The course in Canvas is robust!

Select CIOS survey from 2016-2023 excerpts of student comments on Instructor Greatest Strength referencing teaching excellence:
- *Her expertise and enthusiasm for the course made it easier to learn and was very motivating.*
- *Clarity of lectures, great in-class notes, HB is a very intentional speaker, and I like how she talks slowly, clearly, and with purpose.*
- *Her clarity in teaching, throughout every lecture you could tell she thoroughly understood what she was discussing and could explain each topic happily and in a way that made me want to learn more.*

Select Thank-a-Teacher notes from 2016-2023 referencing teaching excellence:
- *Dr. HB truly cares for her students and is invested in their success. I had a very rough semester, due to personal issues, and she was very understanding and helpful. She teaches with enthusiasm and is available for office hours, where she takes her time to explain tough concepts. It truly makes a difference when a professor enjoys what they do and cares about their students.*
- *Thank you so much for being an awesome professor. I truly enjoyed my time in your CS 1332 class, and I loved learning about how to better organize data and model real-world situations through the data structures and solve problems with algorithms. You have done an awesome job teaching the class, and I feel so much stronger and more confident as a programmer and a student than before. On top of all of that, the level of care and effort you put in to make this class great is phenomenal. I have never seen a class have as many resources online, ranging from the class notes, to the reality checks, to a whole host of slides presentations to help us understand the material, and much more. In addition to that, the atmosphere you build in the classroom and with the TAs is unique. I have always felt comfortable asking you and the TAs for help when it comes to homework, exam preparation, the course material, etc. Thank you for being a great person and professor, Dr. HB. I am*

proud to have been in and learned so much in your class. I wish you all the best and I hope we meet again! :)

Awards for Excellence in Teaching

Monica Sweat Outstanding Lecturer in External Engagement Award – 2022
Georgia Tech's Undergraduate Educator Award – 2020
William D. "Bill" Leahy Jr. Outstanding Instructor Award – 2019
Georgia Tech's Education Partnership Award – 2019

Use of Innovative Strategies that Address the Challenges of Teaching Large Core Courses
Videos

The production of teaching videos for CS1332 spanned 2018-2019 for an online version of CS1332 that launched Fall of 2019. I made 117 videos for the course. We approached these videos with the queston, "What do the students need to see in order to learn if videos are all they have?" Here is a link to the slides for Linked Lists, http://tinyurl.com/4z5zrnwp. Unfortunately, the videos are housed on Kaltura and cannot be downloaded or linked. They are managed by GTPE.

Select CIOS survey from 2016-2023 excerpts of student comments on Instructor Greatest Strength referencing the videos:
- *She was very enthusiastic about teaching computer science and it made me enjoy learning about it. Her module videos explain the concepts incredibly well. They are the best lecture videos I have ever watched compared to other courses.*
- *The modules videos were great! They were so clear, relevant, and concise. They helped me study for exams as well as complete the homework. They were well prepared. The diagramming was well depicted, and they were slow enough to take notes on. I'm glad they were short and we could complete them at our own pace rather than a whole 50 minute lecture.*
- *She very clearly knows the material inside and out and is willing to go above and beyond (for example, the videos) to make sure students can succeed.*
- *I feel that professor HB took the time to explain what was happening in all of her lecture videos and I came out of lecture feeling confident that I knew how to implement the concept at hand. The visual aids in the videos and throughout the rest of the course were extremely helpful too!*

Select Thank-a-Teacher notes from 2016-2023 referencing the videos:
- *Hi Professor HB, I have never met you before or have sat in one of your classes. However, I would like for you to know that the online version of CS1332 you coordinate has been the best class experience I've ever had. I believe every online class should aspire to be the level of CS1332. Thank you for taking the time to make all of those module videos; they are an extremely great resource.*

CSVISTOOL

I supervised the development of the Visualization Tool for CS1332 which began in 2019. I felt very strongly that students needed to see what was happening other than my examples during lectures. Data structures and algorithms are so abstract and difficult to understand without a

visualization www.csvistool.com. The CSVISTool displays the structure, details the movement, traces the line of code being implemented, as well giving the students notes and tips on edge cases. This tool is a game changer in the course. The topics covered coincide with content and implementations in the CS 1332.

Select CIOS survey from 2016-2023 excerpts of student comments on Instructor Greatest Strength referencing the csvistool:

- *How clearly she communicated the subject. All of HB's videos were extremely explanatory and addressed my questions well. If there was any edge cases left that I was curious about, I could simply use the CS Vistool provided.*
- *The module videos were extremely helpful and the visualization tools were much appreciated.*

Select Thank-a-Teacher notes from 2016-2023 referencing the videos:

- *Very good communicator of complicated concepts both in person and in the videos.*
- *I am delighted to assert that the video lectures delivered by Dr. HB were exceptionally insightful and highly beneficial to my learning experience. Dr. HB's teaching style is engaging and clear, making complex concepts accessible and easy to grasp. The way they conveyed the subject matter, with real-world examples and practical applications, truly enriched my understanding of the material.*
- *Hi there Dr. HB…Thus far I have not had a professor who put in as much effort (or asked as much from their TAs) as you have. From the well put together modules to the lectures to the vistool and all the other resources you and TAs have put together, I have not seen a course as passionately delivered as this. Not only can I tell that you have been teaching this information for a while, but I can tell that you really care about the outcome of your students and the messages you leave them with.*

Recognition of the CSVISTOOL

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Global Open Education Week Featured "Data Structures & Algorithms Visualization Tool" – 2021 Details here: https://www.openeducationweek.org/resources/data-structures-algorithms-visualization-tool

<u>Evidence of ability to engage, challenge, and support students</u>

My lectures are designed for a tiered approach to learning. Pedagogically, I want the students to be exposed to a topic four times. First with a quick review of the videos, followed by my lecture and activities, then in recitation with TAs and worksheets, and lastly with the homework implementations. I have created Extension Worksheets, "Food for Thought", and challenged them with new content.

The fifteen extension worksheets are comprehensive questions and work on every given topic. A snapshot of part of the worksheet is on the right.

Given the following information on AVL Tree

The *height ≤ internal* nodes and *external nodes ≤ 2* ^{height}. The average case of a AVL will have some balance to it.
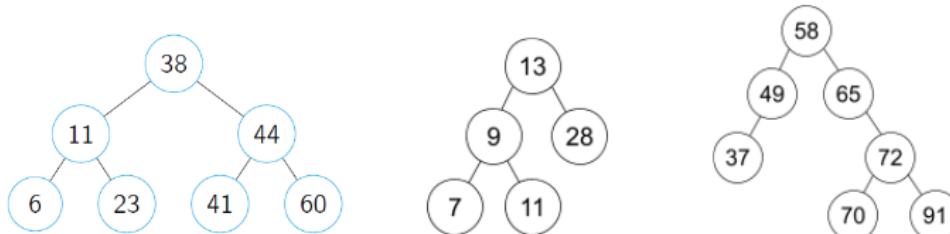
1) Fill in the heights and Balance Factors of each tree.

2) Indicate where in the tree it is out of balance and what rotation is needed.

3) Perform the rotation on the trees that require it and create the final AVL tree.

"Food For Thought" Boxes are higher level concepts of a topic, but are not required. However, I wanted to expose the students with where they could go with CS1332 knowledge.

What do programming languages use? - Food For Thought ⚡

"Food for Thought" Box

What do actual programming languages use?

Let's look at three different languages that have some standard implementations: Java, Python, and C++.

- Java's implementation is the HashMap ⤴, which uses a variation of external chaining. It starts off with external chaining, but if a chain reaches a certain threshold in size, then it will instead use a balanced BST (we'll cover self-balancing BSTs in the next course), sorting based on the hashcodes and the natural ordering imposed by Comparable if implemented. This threshold approach is used because for small chains, the overhead of a BST is not worth it since the performance costs are similar for small n. The max load factor is by default 0.75.
- Python's equivalent is the dictionary. There are variants, so let's look at the CPython implementation ⤴. This implementation uses a variation of an open addressing strategy like linear probing. It's difficult to describe in detail without getting into the nitty gritty, but it uses a linear recurrence (rather than just incrementing like in linear probing) to determine the probe sequence. Then, it adds a "perturbation" to the recurrence to change how it probes for common failure cases. The table also uses powers of two rather than prime numbers, and the max load factor is 2/3. The link above is worth taking a look at if you're interested; the documentation gives some interesting commentary on the design decisions made in the implementation.
- For C++, we have the unordered_map ⤴, which uses external chaining. An interesting thing about this is that the max load factor defaults to 1.0, which is a nice reminder that external chaining is the only strategy we've seen where the load factor can exceed 1.

Just looking at these three implementations gives us some interesting strategies and design choices made by the developers, which reminds us that these strategies are not set in stone. It's also good to note that these designs and standards can change over time, so it's possible these will change with more data and later version numbers.

Engaging students in and out of the classroom is what I love to do. A topic I teach in the course is pattern matching. Two of the algorithms are Boyer-Moore and KMP. It turns out that former Dean Zvi Galil developed a modification algorithm that wove the two together for linear performance. I challenged my students and TAs for years to come up with an implementation for Galil Rule which had not been done before. I finally had someone actually do it. I supervised a team of students in the implementation. The results were spectacular. The team presented their work to Zvi Galil, himself. He was so pleased with what these students had produced. We added this new implementation to CS1332 with slides, pseudocode and a visualization within the csvistool.com.

History

- Developed by **Zvi Galil** (former Dean of the College of Computing)
- Article, *On improving the worst case running time of the Boyer-Moore string matching algorithm* [ACM, 1979]
- Linearizes the worst case runtime of the full Boyer-Moore algorithm

Select CIOS survey from 2016-2023 excerpts of student comments on Instructor Greatest Strength referencing the Engagement, Challenge and Support:

- *I tried implementing the Galil optimization but the paper was a little more than I could wrap my head around, more so in terms of figuring out how to properly identify a period without fail, not to mention I was busy with family over the thanksgiving break. Thanks for being such a good teacher this semester. You are one of the seemingly few professors at Georgia Tech that cares deeply about both their subject matter and about education. It made a world of difference for me.*

Dedication to Student Success and Accessibility to All Students

Accessibility and success of my students is at the forefront of my instruction. Currently, I am in the process of directing TAs to rewrite the SRT files that accompany the 117 videos in the course. I mentioned this in my Reflective Teaching Statement and I look forward to ensuring everyone can hear and see my content. The CSVISTOOL was mentioned in innovations and is being made accessible globally through the Open Education Week. Here is a snapshot from Google Analytics on visits to the CSVISTOOL.

Users by Country
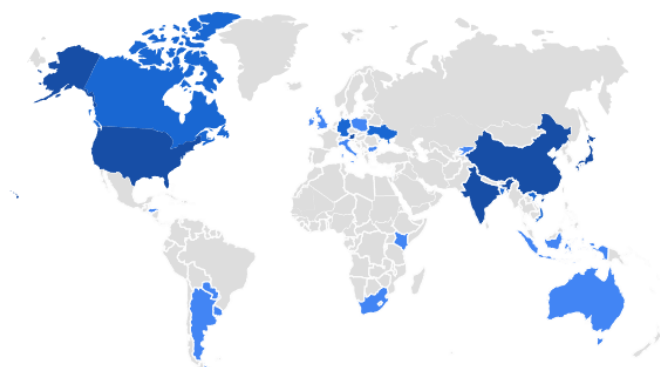
COUNTRY	USERS
Austria	53
United States	53
India	28
China	23
Japan	13
Ukraine	4
Vietnam	3

Select CIOS and Thank-a-Teacher excerpts from 2016-2023 of student comments on Instructor Greatest Strength referencing the Dedication to Student Success and Accessibility:

- *Her passion for what she taught and her connections with students. She still talked about students she had decades ago.*
- *I wanted to take a minute to thank you for being a FANTASTIC professor and a "squeaky wheel" for your students. While Georgia Tech has some work to do in terms of Disability Services, it is inclusive and caring professors like yourself that make it possible for students like me to succeed at Tech. From making course materials easily accessible to speaking up for me about my challenges within the Disability Office, I will be forever grateful for everything you did this past semester to help me be successful. Keep being an outstanding professor and advocate for your students!*
- *I am an applied math major and so I am basically a cs major at this point as well. However, unlike the average cs major, cs is not one of my strengths and I struggled at the beginning of the semester. I did poorly on the first exam and the homeworks took ages (and rightfully so). Nevertheless, I continued to press on, and with the continued help of wonderful lectures and TA support the information started to click and I improved. I*

improved so much so that I scored perfect on midterms 2 and 3 (with some tiny help from extra credit). I am certainly very proud of that, but to deny you credit in that success would be a disservice and dishonest. Your enthusiasm for the course came across in many ways: taking the time to go through everyone's exams one by one yourself, answering any and all questions at all times, showing up in the face of physical ailments, etc. I don't think I'll ever meet a professor other than you that is willing to show up after snapping something in the back of their knee at 7:30 in the morning.

- *HB cares. She cares about her students, her TAs, and especially about 1332. I do not know what her situation is, but I honestly felt like I was her only section of 1332. She spoke to us in class very casually, but with authority. At the beginning of the semester, she told us a story about her dog and how she thought she wouldn't like him and then ended up really liking him. She told us that we might think that about 1332. I thought that was bologna, but through the course of the semester I found myself enjoying 1332 and especially HB's lectures. I appreciate her sincerity, her work ethic, her intelligence, and her sense of humor.*

Impact on Students' Lives, In and Beyond

Computing and Engineering with LEGO® and Scratch, CELS - The evolution of CELS came from the vision of a professor, the fearlessness of an elementary teacher, the passion of an undergraduate student, and the collective perseverance of three women to bring computing to children at Willis Road Elementary School, WRES. After years of doing "Hour of Code" events at WRES, it was clear that we were not making progress towards computing literacy. CELS is designed for third, fourth, and fifth grade students. CELS lessons are based upon the Scratch programming language and LEGO® WeDo construction kits. The CELS Program officially launched in early 2018. Over 2 years, the impact and success with GT students as well as the elementary students was a resounding success. The program did come to a halt with the onset of the pandemic.
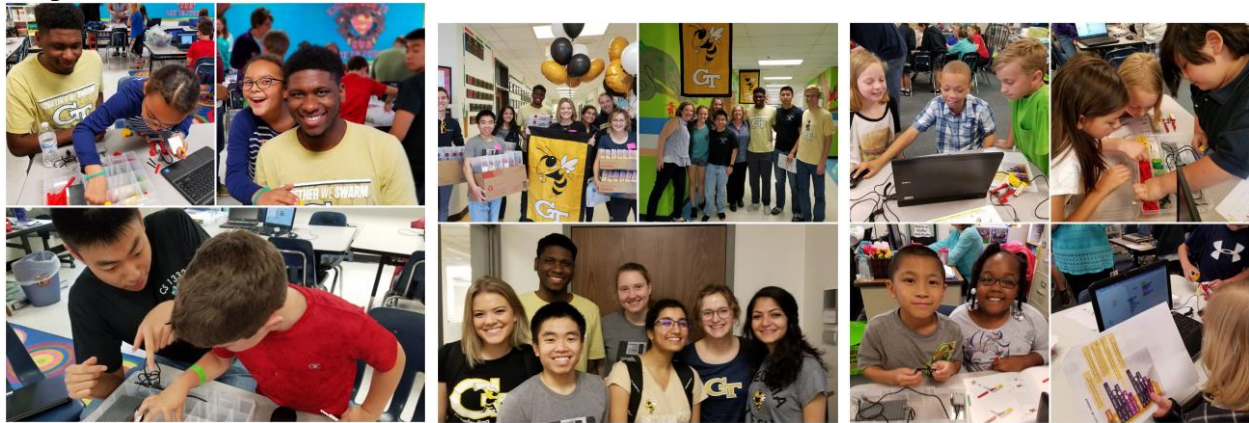
School of Computing Instruction (SCI) Undergraduate Teaching Assistant Scholarship - The School of Computing Instruction (SCI) Undergraduate Teaching Assistant (UTA) Scholarship was established in SCI's inaugural year (2022) by me to honor the phenomenal UTAs who assist SCI faculty in course management and delivery. With SCI teaching practically every student in the Institute, UTAs have been an integral part of student (and course) success for many years.

Over the years, I have invited many of my former TAs to come present on behalf of their companies but focus on how 1332 is used in their everyday work. We have created a network on Facebook and LinkedIn where 1332 Alumni TAs. Currently, we are more than 139 strong out in industry. Many companies come to present to my current 1332 students.

I would like to share a couple of personal stories. Just before the pandemic in January 2020, a recently hired TA had arrived in Seattle to begin their new job. Alone, isolated, unable to connect with people sent this individual into a depression. The person called me and wanted to know what to do. I reached out to two other former TAs who were there and asked them to just talk to and support the individual. Over the coming months this proved to be a life affirming moment for all involved.

Lastly, I would like to share two photos of weddings. My 1332 TAs have invited me to their weddings and I have the best time. In fact, the majority of the attendees are former 1332 TAs themselves. In all the photos, everyone is a GT alumn and former 1332 TA, with the exception of my husband ☺.

[Good Georgia Tech citizenship](#)
I absolutely love my job and Georgia Tech. I have assisted GTPD with an app they were developing to connect with students on social media. I spent time debugging and giving them feedback on the app before it was launched. I developed a budget and scholarship tool to optimize funding of students on the GT Baseball team. I spent 3 years developing tool and assisting the coaches.

I have served my School of Computing in an administrative with scheduling courses and faculty for Spring Summer and Fall since 2023. I am currently overseeing construction of the school space while construction and repairs take place. I oversee the school's Junior Design Expo. I have served on National and International committees. I am currently serving on the Dean's Search Committee for the College of Computing, and am chair of the School Advisory Board for SCI. I have a long list of service at GT.

I have attended the Association of Computing Machinery Special Interest Group in Computer Science Education conference many times and have presented the last 3 years. I volunteer at local elementary and middle schools in rural areas to bring computing to these young people.

Dear CTL nomination committee:

I am delighted to nominate my colleague, Dr. Mary Hudachek-Buswell, Senior Lecturer and Associate Chair of the College of Computing's School of Computer Instruction, for the Geoffrey G. Eichholz Faculty Teaching Award. Mary is an ideal candidate to receive this award, which recognizes teaching excellence, dedication to undergraduate education, and a significant contribution to the Georgia Tech community.

Having had the privilege of co-teaching two courses alongside Dr. Hudachek-Buswell, I have personally witnessed her remarkable organizational skills and unwavering character. During our collaborative teaching of CS1315, the Introduction to Computing with Media Computation course that is required for students from the College of Business, I had the opportunity to attend all of her lectures. Throughout this experience, it became evident that Dr. Hudachek-Buswell consistently dedicated herself wholeheartedly to her students. She diligently ensured that even those students who initially harbored doubts about their coding abilities discovered the joy in acquiring a new and valuable skill.

One year later, when both of us were teaching CS1301, the Introduction to Computing course, I saw first-hand her unwavering commitment to keeping the curriculum current. She took great care to ensure that the course material remained relevant, equipping our students with knowledge that would prove invaluable in their subsequent courses and professional endeavors. Presently, she assumes the responsibility of teaching CS1332, Data Structures and Algorithms, a course that typically enrolls almost 1000 students per semester. Mary handles this substantial student load with remarkable patience and wisdom, ensuring that every student feels valued not only as a learner but also as an individual with distinct aspirations and dreams.

Mary's versatility in teaching is truly noteworthy. She has successfully delivered essential courses for all computer science majors, such as CS1301, CS1331, and CS1332, which are taught in Python and Java. Furthermore, she has taken on the responsibility of instructing courses required for Engineering majors, including CS2316 and CS1371, which utilize SQL and Matlab. In numerous instances when no one else was available to cover a course section, Mary readily volunteered to teach an additional class, demonstrating her unwavering dedication to both the department and the students who depended on that particular course.

Her approach to structuring course materials is remarkably diverse, tailored to cater to the unique needs of each group of students enrolled in her classes. She goes the extra mile by providing individualized support for students requiring special accommodations, even crafting entirely new assessments when necessary to facilitate their success. Mary actively engages with the latest pedagogical techniques, frequently attending training sessions offered by the Center for Teaching and Learning and skillfully implementing these innovative ideas within her courses.

Two years ago, Mary and I restructured the Introduction to Computing course to incorporate data science methodologies, ensuring its relevance to our students. Amid the challenges posed by the pandemic, Mary undertook the daunting task of independently developing an online version of the CS1332 Data Structures and Algorithms course from scratch. This involved creating all the exercises, homework assignments, and devising a comprehensive online examination format.

Mary's influence on students' lives extends beyond the classroom. She mentors dozens of undergraduate teaching assistants each semester, serving as an inspirational role model and motivating them to aspire to the highest standards of teaching excellence. Her dedication to their growth is evident as she even organized a visit to an elementary school, providing them with a firsthand experience of the meaning of service. Consequently, the opportunity to be a teaching assistant for Mary's course has become highly coveted among our undergraduate students, driven by their desire to emulate her and excel in their teaching roles. Remarkably, two of her undergraduate teaching assistants were nominated for and

subsequently awarded the Institute Undergraduate Teaching Assistant (UTA) accolade. Mary's inclusive and appreciative attitude is reflected in her current group of teaching assistants, which boasts a fifty percent female composition and includes individuals from diverse nationalities and racial backgrounds.

Mary is also a prominent member of the Georgia Tech community in the College of Computing and campus-wide. She has served HackGT as a judge many times. Last year she also served as a mentor to an Idea to Prototype (I2P) team that was a finalist for the competition. She serves on two Faculty Governance committees to ensure that Georgia Tech policies meet our students' needs.

Mary is an advocate for computer science in the wider community too. For the past several years she has been teaching a lego robotics unit at a rural elementary school-- a task including purchasing robotics equipment, taking groups of Georgia Tech students in vans from campus to supervise and inspire the students, and designing engaging curriculum for the program. This program has proved to be extremely successful and popular with the elementary school students and also with their teachers.

Many of Mary's students have shown their own appreciation for Mary by writing her "Appreciate a Teacher" letters of which she has received many over her years here at Tech. These letters share a common theme - her ceaseless willingness to give of her time to help her students succeed.

Because of her dedication to teaching and learning, and her focus on student achievement, I am proud to nominate Dr. Mary Hudachek-Buswell for the Geoffrey G. Eichholz Faculty Teaching Award. She is a great role model for me and an inspiration for other instructors at Georgia Tech who value excellent teaching.

Sincerely,

Melinda McDaniel, Ph.D.

Senior Lecturer

School of Computing Instruction

Georgia Institute of Technology

Nomination Support Letter, Ms. Anh Le

February 2, 2024

To the Eichholz Faculty Teaching Award Committee,

It is with great pleasure that I submit this letter in enthusiastic support of Dr. Mary Hudachek-Buswell's nomination for the prestigious Eichholz Faculty Teaching Award. My association with Dr. HB spans the entirety of my academic journey at Georgia Tech, offering me the unique perspective of both her student and teaching assistant.

Dr. HB's unparalleled commitment to excellence in teaching CS1332 - Data Structures and Algorithms is well known among the College of Computing. I took her course the semester I transferred from a small community college into Tech. Even after six semesters, her course remains the epitome of educational excellence for me. Dr. HB has meticulously curated a plethora of resources to cater to diverse learning preferences, ensuring every student's success. From pre-recorded module videos, a Visualization Tool (accessible at csvistool.com), to comprehensive extension worksheets and detailed lecture notes, each resource reflects her dedication to clarity, accessibility, and relevance.

Her teaching philosophy transcends traditional lecture methods. Dr. HB is aware of the diverse academic backgrounds of her students, and actively extends her support beyond Computer Science majors by providing tailored resources, such as in-depth Java tutorials, ensuring all students find a supportive learning environment. This inclusive approach speaks volumes of her commitment to educational equity.

Dr. HB doesn't stop enhancing and innovating the course, even after years of teaching CS1332. During my first semester working with her as a teaching assistant, an instance perfectly illustrated her commitment to academic excellence and student engagement. A proactive student approached Dr. HB with a proposal to integrate the Galil Rule—an optimization technique for string-searching algorithms, originally developed by Dr. Zvi Galil, a distinguished former dean of the College of Computing. Dr. HB immediately endorsed the student's initiative and assembled a team of Teaching Assistants, myself included, to spearhead this ambitious project. We successfully introduced this topic to the course content in Spring 2022.

Beyond the classroom, Dr. HB embodies the spirit of a true educator. Her office hours are well-known among students for her patient, personalized approach to addressing individual challenges. As the Head Teaching Assistant under her guidance, I've witnessed firsthand her extraordinary efforts to support students' mental and emotional well-being. From assigning TAs that host extra 1-1 office hours to students who need extra help, to her thoughtful consideration of students with color vision deficiency when writing exams, Dr. HB's actions consistently affirm her genuine care for students' holistic success.

Dr. HB's influence on her students and assistants alike is immeasurable. Her innovative teaching methods, combined with her compassionate approach to student engagement, make her an outstanding candidate for the Eichholz Faculty Teaching Award. It is educators like Dr. HB who inspire and shape the future of academic excellence at Georgia Tech.

Thank you for considering my heartfelt endorsement of Dr. Mary Hudachek-Buswell for this honor. Her remarkable contributions to the academic community and her profound impact on students' lives make her a deserving recipient of this prestigious award.

Sincerely,

Anh Le
B.S. Computer Science 2024
Georgia Institute of Technology
hanh9@gatech.edu

Awards Selection Committee,

My name is Ethan Fox, and I am writing to recommend Dr. Mary Hudachek-Buswell (Most students call her Dr. HB) for the Geoffrey G. Eichholz Faculty Teaching Award. As a computer engineering student who has taken her Data Structures and Algorithms (DS&A) Course, Dr. HB has had a profound impact on my education at Georgia Tech.

As one of the first courses I took towards my major at Georgia Tech, I found Data Structures & Algorithms to be an interesting and fun course. Little did I know the impact this course would have to essentially every other computer science related course I would take at Georgia Tech. Because of this, I am fortunate my education was in the hands of Dr HB. From the care she gives her students (all 900+ on any given semester) to the quality of course content and resources she provides, Dr HB has made it clear that she wants CS 1332 to be the best class any given student will ever take at Georgia Tech.

Through her instruction, it is easy to see the level of care Dr. Hudachek-Buswell puts into her lectures at Georgia Tech. As one of the first courses I took at Georgia Tech, Dr HB's lectures over course materials provided me with knowledge I would come to use in numerous other classes. In these lectures Dr HB also made an effort to stress the real-world implications of the content we learned. I particularly enjoyed this as it made data structures we were learning more tangible and grounded in everyday relevance.

I can confidently say I have yet to take a course like Dr. HB's with the quantity and quality of resources for students. The amount of care and attention that is put into her course is unparalleled. In addition to the usual weekly lectures, Dr HB provides prerecorded module videos, review slides, course worksheets, an entire visualization tool developed in-house to just name a few. There's course materials for every type of learning medium whether it be reviewing the comprehensive lecture slides or watching the bite-sized module videos over every topic.

It is with great enthusiasm that I wholeheartedly recommend Dr Mary Hudachek-Buswell for the Geoffrey G. Eichholz Faculty Teaching Award. Her data structures and algorithms course, in particular, has been a very impactful and important class for me as a computer engineering student.

Ethan Fox

BS Computer Engineering, 2024

Georgia Institute of Technology

Nomination Support Letter, Ms. Caroline Kish

Members of the CTL Geoffrey G. Eichholz Faculty Teaching Award Selection Committee:

It is my honor to provide Dr. Mary Hudachek-Buswell with a letter of recommendation and support for the CTL Geoffrey G. Eichholz Faculty Teaching Award. Her unique and effective teaching style, her empathy inside and outside of the classroom, and her drive to always improve the student experience in her course, and in Georgia Tech as an institution, make her the most deserving recipient of this distinction.

When I first entered Georgia Tech as a Computer Science major four years ago, I had zero confidence in my abilities and all the fear in the world that had built up because of GT's reputation as an inherently 'hard' school. I had been told countless times that to succeed required innate intelligence, and for me, used to succeeding based solely on work ethic, this meant that I was destined for failure. Little did I know however, that this paradigm of mine would shift entirely based off the Computer Science professor who taught my Introduction to Computing course. I am so lucky that Dr. HB was my first professor freshman year. Yes the class was difficult, but her teaching was engaging and unique. She drew connections with the real world to help solidify core concepts of programming. Furthermore, she took all questions seriously, including the most basic ones. She gave me, and the other students in the course, the ability to feel confidence in our ability to achieve the success that I had thought unattainable.

Dr. HB's passion to help other students learn helped me realize that I am also passionate about helping others learn. She helped me realize that I wanted to give students the confidence that I, myself, sometimes lack. Because of this, I became a teaching assistant. I started off TA-ing for the introductory CS course, but eventually became a TA for the Data Structures & Algorithms course, which Dr. HB teaches. As one of Dr. HB's TAs, I have seen even more of how much she cares about her students and how she strives to make sure that each student is satisfied with the knowledge they learn in her course. She encourages TAs to develop new learning materials for the course so that students have resources that appeal to all different types of learners available to them. Additionally, she changes her course based on student feedback from past semesters - for example, when students requested more practice problems, she started offering more 'reality checks' inside and outside of the classroom with practice problems to solidify the concepts learned in class.

Dr. HB also teaches the most successful online course I have ever seen at this university. Her online version of CS 1332 Data Structures and algorithms is just as rigorous and informational as the campus version. Furthermore, the online students have access to the same resources as campus students including TAs, practice problems, and office hours. She ensures that the online students are treated fairly given the sometimes difficult adaptation of in-person exams to Canvas exams. She is always patient and reassuring to the online students just as she is to the in-person ones, which makes students feel comfortable that they can give her feedback about the course as well as go to her with personal problems that they encounter.

Dr. HB does not just show her concern for students inside of the classroom. She is also available as a mentor even after students leave the course. She is always available by email or by a knock on her office door. She is loyal to her students - she will fight to help them in any way that she can, which to me, is a rare and extremely admirable quality at this institution. She works hard to

make sure her students and TAs have accessible career opportunities, and she offers professional advice to anyone who wishes it.

Dr. HB embodies everything that an educator should be. She gives students a reason to have faith in professors. There is no one more deserving of the Geoffrey G. Eichholz Faculty Teaching Award than she is.

Regards,

Caroline Kish

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Georgia Institute of Technology
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