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Application Summary

Competition Details

Competition Title:	2023 Teaching Excellence Award for Online Teaching
Category:	
Cycle:	
Submission Deadline:	02/12/2023 11:59 PM

Application Information

Submitted By:	Joel Sokol
Application ID:	9822
Application Title:	Joel Sokol
Date Submitted:	02/11/2023 8:51 PM

Personal Details

Applicant First Name:	Joel
Applicant Last Name:	Sokol
Email Address:	jsokol@isye.gatech.edu
Phone Number:	(404) 894-6484

Primary School or Department

ISyE

Primary Appointment Title:	Professor

Application Details

Proposal Title

Joel Sokol

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[1] Please accept these letters of support from online students. They were solicited for our nomination of Prof. Sokol for a different award, and because it is so close to the submission deadline there was not enough time to get revised versions. As you'll see, their content is very relevant to this award, especially in the areas of student success, learning and impact; student mentoring; and engagement with students beyond the virtual classroom.

February 7, 2023

Dear GT Committee for Teaching Excellence Award for Online Teaching,

We would like to nominate Prof. Joel Sokol to receive the Georgia Tech Teaching Excellence Award for Online Teaching. We feel that Joel's contributions to online education at Georgia Tech are unparalleled and that he is highly deserving of this honor.

Joel arrived at Tech's School of Industrial and Systems Engineering (ISyE) in 1999, after completing his Ph.D. at the Massachusetts Institute of Technology. He is currently a Full Professor in ISyE; and he has been an affiliated faculty member in Tech's highly prestigious Algorithms, Combinatorics, and Optimization (ACO) program and the Supply Chain and Logistics Institute (SCLI) — illustrating the impressive breadth of Prof. Sokol's theory and applications-oriented interests and activities. He is also Director of our incredibly successful interdisciplinary Master of Science in Analytics degree (both on-campus and online), which serves many thousands of students, and which he developed almost single-handedly.

Joel has had a life-long commitment to education, and he certainly hit the ground running when he got to Tech, immediately becoming an incredibly popular teacher. In fact, he is arguably the best in ISyE, and his CIOS scores bear this out by being consistently high (usually around 4.7), even in challenging required large-section courses. Joel's lecture style combines theory with real-world applications, making it easy for students to relate to and absorb the material. For instance, Joel often incorporates in his lectures all manner of examples from sports analytics (he is a nationally known expert in this area) to supply chain optimization to healthcare policy issues. This keeps his classes fresh and timely, and his students engaged and eager to learn.

Joel has gone above and beyond the call of duty with respect to at least two remarkable long-term educational contributions:

- The overhaul and reimagining of ISyE's undergraduate Senior Capstone course; and
- The development of our bellwether M.S. in Analytics (MSA) program, which has motivated the current nomination.

Regarding our Senior Design course, Joel established: a formal set of processes for the course, modernized how it was henceforth conducted, helped adopt it to a one-semester implementation, provided the path to accommodate a cohort of over 250 students (and perhaps 50 teams) per year, and put forth formal assessment criteria to evaluate student performance. This effort has paid off in significantly better student engagement, more-successful projects, a number of scholarly papers in archival journals, and several awards, including the prestigious IIE/CIEADH Innovations in Curriculum Award in 2012.

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H. Milton Stewart School of
Industrial and Systems Engineering
Atlanta, Georgia 30332-0700 U.S.A.
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But it is for Georgia Tech's MSA program that Joel's star shines especially bright, in particular, its online implementation. Since its inception in 2017, the online MSA (OMSA) has been *transformational*. It has enabled thousands upon thousands of students to obtain a modestly priced graduate degree and enter this fast-growing and crucial STEM field. In fact, we have about 2500 graduated students as well as 6000 students currently enrolled. Joel has put together the country's premier program that features several synergistic educational tracks of interest; pedagogically state-of-the-art, well-produced courses; an efficient admissions/decision process; excellent means of communication among students, faculty, and staff; and a rigorous assessment regimen inspired by his participation in the GT Faculty Learning Community. And notably, our student cohort exhibits diversity in terms of prior education, age, socio-economic means, location around the world, and gender and ethnicity. Joel has personally developed the highly attended and hugely important introductory and Capstone courses for the program; these classes sometimes have enrollments exceeding 1000 students!

In fact, the program has become so successful in generating both prestige and revenue for Georgia Tech that other STEM schools around the country are busy copying it! Further, Joel is now regarded as an expert in online education and, to that end, he has been quoted extensively regarding online education by such outlets as *Forbes*, *Fortune* online, *Hacker News*, *Inside Higher Ed*, NPR, TechTarget.com, TowardsDataScience.com, and *U.S. News & World Report* — this makes Georgia Tech look really good!

Joel is not resting on his laurels: He is in the process of putting together *several* MicroMasters and Certificate programs that will bootstrap courses from the OMSA in concert with colleagues from various schools at Georgia Tech.

In this nomination packet, we provide a resume detailing all of the many education-related awards that Joel has won over the years — almost everything possible at Tech. Moreover, he has offered remarkable service with respect to education activities both at the school and international levels. We will also find heartfelt testimonials from many of his students and colleagues. One can easily see that Joel is the most-popular teacher in the online program and how he's won all of those teaching awards.

The bottom line is that the ISyE Awards Committee is honored to nominate Joel for the Georgia Tech Teaching Excellence Award for Online Teaching. He is the epitome of an academic scholar who loves the opportunity to share his knowledge; and we strongly feel that he is highly of the Excellence Award.

Sincerely,

H. Milton Stewart School of ISyE Awards Committee

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February 6, 2023

To Whom It May Concern,

I am writing this letter to enthusiastically recommend Prof. Joel Sokol for Georgia Tech's Teaching Excellence Award for Online Teaching. In this recommendation, I will say a few words about his research and then jump into comments on his teaching and related service. First of all, Joel's research has been in the areas of applied operations research, health systems, and sports analytics. Besides working on highly theoretical optimization projects, Joel is that rare individual who can translate theory into applications—which can subsequently be used in the classroom as motivational examples to enhance the student learning experience. For instance, his sports analytics work on NCAA Basketball prediction engenders substantial classroom discussion as well as attracting significant national attention (the associated website www.isye.gatech.edu/~jsokol/lrmc has accumulated hundreds of thousands of hits since its inception in 2007).

Joel is ISyE's best teacher. In terms of CIOS-based student evaluations, his scores are routinely in the incredible 4.9–5.0 range for his in-person classes and are typically about 4.7 for his *gigantic* (see below) online classes—which may be even more astounding! And it's just amazing how many awards he's won. Moreover, Joel has devoted tremendous effort to educational activities—more so than any other ISyE faculty member, e.g., he and Prof. Steve Hackman are responsible for the revamping and remarkable success of ISyE's capstone Senior Design program over the last few years.

Joel has also done a huge amount of service, both at the local and national levels, much of which has an education bent. For example, on the national scene, he was the Institute for Operations Research and the Management Sciences (INFORMS) Vice President for Education from 2011–2014, after having held other important positions within INFORMS. He has also been an Associate Editor for the *INFORMS Transactions on Education* since 2007.

In terms of specific online education contributions at Georgia Tech, Joel's record is absolutely amazing. As Founding Director of our M.S. Analytics (MSA) program, he has overseen exponential growth in the number of participating students. Moreover, he has developed what are arguably the curriculum's two most-important courses: ISYE 6501 (the introductory course for the MSA), as well as ISYE 6748 (the capstone project course for the MSA). It is noteworthy that Joel occasionally has *over 1000 students* taking ISYE 6501!

But Joel's online activities don't stop with his classes. In particular, he has helped other faculty members develop online classes – I know this from personal experience, since Joel provided me with timely templates and sage advice when I as I prepared my ISyE 6644 course. Joel has also participated in course and program assessment, and he is currently developing an online certificate program (with a small assist from me). All of this bodes extremely well for future online education augmentations.

In summary, I give Prof. Joel Sokol my strongest recommendation. He is ISyE's "go to" faculty member in terms of education excellence, and I believe that he is highly deserving of the GT Teaching Excellence Award for Online Teaching. Please do not hesitate to get in contact with me if you have any questions regarding this recommendation.

Sincerely,

Prof. David Goldsman
Coca-Cola Foundation Professor and Director of Master's Programs, sman@gatech.edu

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Sokol, Joel - #9822   5 of 22

February 6, 2023

Dear Awards Committee,

I am writing this letter to express my strong support of the nomination of Professor Joel Sokol for the Georgia Tech Excellence Award for Online Teaching. Professor Sokol has put together a truly remarkable career with respect to applied and theoretical research scholarship, teaching and mentorship, and local and national service. For the purposes of this recommendation, I will concentrate on aspects of his teaching accomplishments.

Prof. Sokol is perhaps the most-valued teacher in ISyE, and he is certainly one of the best in the College of Engineering. *He has changed how we deliver educational material, and he has increased our reach exponentially.*

An early major pedagogical accomplishment is his work in collaboration with Professor Steve Hackman on ISyE's Senior Design program. This effort has had a significant positive impact on our undergraduate student Capstone experience and won the prestigious 2012 IIE/CIEADH (Institute of Industrial Engineers / Council of Industrial Engineering Academic Department Heads) Innovations in Curriculum Award. It is also notable that Professor Sokol has won several teaching awards within Georgia Tech and ISyE. For instance, in 2005 he received the Institute-wide ANAK Society Award (and was the first junior faculty awardee in over 60 years); and as recently as 2014 he received the Class of 1940 W. Howard Ector Outstanding Teacher Award. Moreover, his Senior Design project groups routinely receive awards for excellence.

Professor Sokol's teaching and service has culminated with his tour de force – Georgia Tech's interdisciplinary Master of Science Analytics (MSA) program, for which he is the Founding Director. The on-campus MSA program was launched in 2014 with the online version (OMSA) commencing in 2017. The results have been beyond our wildest imagination for this first-of-its-kind program: approach 2,500 OMSA graduates and 6,000 current students. This has been made possible by a well-planned and timely curriculum, the program's modest tuition price tag of about $10,000, and several substantial curriculum development grants – all of which Professor Sokol has deftly coordinated. Professor Sokol has personally developed two of the most-popular OMSA courses: ISYE 6501 (Introduction to Analytics) and ISYE 6748 (Capstone). He is currently developing complementary MicroMasters and interdisciplinary Certificate programs in an online format. Such offerings will enhance the reputation and impact of ISyE and Georgia Tech, while also helping the STEM infrastructure of the State of Georgia as well as the nation's.

Thus, I strongly feel that Professor Sokol's tremendous contributions to online education at Georgia Tech merit the Georgia Tech Excellence Award for Online Teaching, and so I most-enthusiastically submit this recommendation.

Sincerely,

Dr. Edwin Romeijn, H. Milton and Carolyn J. Stewart School Chair and Professor

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Joel S. Sokol
Professor, H. Milton Stewart School of Industrial and Systems Engineering
Director, Master of Science in Analytics

EARNED DEGREES

Ph.D., Massachusetts Institute of Technology, June 1999 (Operations Research)

B.S./B.A., Rutgers University, May 1994 (Applied Sci. in Eng'g; Math; Comp. Sci.); #1 in class

EMPLOYMENT

Georgia Tech H. Milton Stewart School of Industrial and Systems Engineering, 1999-present

Professor, 2018-present; Associate Professor 2007-2018; Assistant Professor 1999-2007

SELECTED HONORS AND AWARDS (ONLINE EDUCATION; *=National/International)

1. * Finalist, edX Prize for Exceptional Contributions to Online Teaching and Learning, 2020
2. * AECT Distance Education Crystal Award, Third Place, 2020

SELECTED HONORS AND AWARDS (EDUCATION IN GENERAL; *=National/International)

1. * Chief Data Officer Magazine: Academic Data Leader ("Leading Data Academics: The World's Top Educators List"), 2021 (inaugural list)
2. MS Analytics Outstanding Faculty Award, 2018 (inaugural awardee)
3. Class of 1940 W. Howard Ector Outstanding Teacher Award, 2014
4. * Keynote speaker on education, EURO/INFORMS 2013
5. * IIE/CIEADH Innovations in Curriculum Award, 2012
6. * National Academy of Engineering Foundations of Engineering Education Fellow, 2011
7. * IIE Excellence in the Teaching of Operations Research Award, 2010
8. Class of 1934 Outstanding Use of Innovative Educational Technology Award, 2010
9. Hesburgh Award Teaching Fellow, 2009
10. Class of 1940 W. Roane Beard Outstanding Teacher Award, 2008
11. CETL/BP Junior Faculty Teaching Excellence Award, 2006
12. ANAK Award, 2005 (first junior faculty winner since award began in 1942)

SELECTED HONORS AND AWARDS (RESEARCH; *=National/International)

1. * Finalist for the Cozzarelli Prize for one of the top 6 papers published in *Proceedings of the National Academy of Sciences* (out of more than 3500 papers), 2016
2. Fouts Family professorship, 2013-2016
3. * EURO Management Science Strategic Innovation Prize, 2007

SELECTED EDUCATION PUBLICATIONS

1. S. Hackman, J. Sokol, and C. Zhou, "An Effective Approach to Integrated Learning in Capstone Design", *INFORMS Transactions on Education* 13 (2013), pp. 68-82.
2. S. Hackman, J. Sokol, and C. Zhou, "A New Paradigm for Higher Quality and More Consistent Senior Design," *Proceedings of the 2010 Industrial Engineering Research Conference* (2010).
3. P.H. Kvam and J. Sokol, "Teaching Statistics With Sports Examples," *Informs Transactions on Education* **5** (2004), pp. 75-86. [This paper was also selected for INFORMS Editor's Cut, Volume 2: Analytics in Sports (2015).]

SELECTED EDUCATION PRESENTATIONS (*=Specific online education content)

1. * "Program Updates Roundtable", Affordable Degrees at Scale Symposium, Atlanta, GA, November 2022 (panelist)
2. * "Connecting Academia & Industry", Gurobi Days 2022, April 2022 (panelist)

3. * "Online Teaching and the Online Master of Science in Analytics", OneIT symposium (online during COVID-19 pandemic), April 2020
4. * "Georgia Tech's Online Interdisciplinary Master of Science in Analytics", Affordable Degrees at Scale Symposium, Atlanta, GA, September 2019
5. * "Georgia Tech's Interdisciplinary Master of Science in Analytics", AACSB Data Analytics Summit, Atlanta, GA, May 2019
6. * "Georgia Tech's Online Interdisciplinary Master of Science in Analytics", Affordable Degrees at Scale Symposium, Atlanta, GA, November 2018
7. * "AI and Talent", Accenture Engage Corporate Roundtable, July 2018
8. * "How Do We Ensure Quality In At-Scale Programs?" (panel), Affordable Degrees at Scale Symposium, Atlanta, GA, November 2017
9. * "Georgia Tech's Interdisciplinary Online Master of Science in Analytics", Affordable Degrees at Scale Symposium, Atlanta, GA, November 2017
10. * "Georgia Tech's Interdisciplinary Master of Science in Analytics: On-Campus, Online, and International", INFORMS conference, Houston, TX, October 2017
11. "Present and Future of Analytics Programs" (panel), Industrial and Systems Engineering Research Conference (ISERC), Nashville, TN, June 2015
12. "The Importance of Academic and Corporate Collaboration for Development of the Analytics Community", Cox Analytics Summit, November 2014 (panel)
13. "The Future of Data Science Education", Data Science Atlanta, June 2014 (panel)
14. "Big Data: How Atlanta Universities are 'Minding the Gap'", SAS Day, Kennesaw State University, May 2014 (panel)
15. * "Industry Interaction and the Future of OR Education," EURO/INFORMS 2013 (Rome, Italy), July, 2013
16. "Engineering a Better Capstone (Senior) Design," IIE Annual Conference, Orlando, FL, May 2012 (co-author S. Hackman)
17. "The Future of Industrial Engineering," Instituto Tecnologico y de Estudios Superiores de Monterrey-Toluca, Toluca, Mexico, November 2005

EDUCATION PROGRAM AND TOOL DEVELOPMENT (*=Includes online education content)
1. * Founding Director of interdisciplinary Master of Science in Analytics degree (on campus since Fall 2014, online since Fall 2017); the degree has been ranked as high as #1 in Data Analytics, #3 in Data Science, and #3 in Business Analytics. Specific to online, with price tag less than $10,000 tuition, this degree makes top-level analytics education available to a wide range of people for whom it was previously inaccessible, in an area where there is a national shortage. OMSA now has over 2400 graduates and 5500-6000 current students, and has attracted a $1,000,000 contribution from AT&T and a $1,000,000 contribution from Accenture to support curriculum development.
2. * Founding Director of interdisciplinary edX MicroMasters program in Analytics. Using three core online courses from the Master of Science in Analytics, this program has been offered on edX.org since Summer 2017. The program has had thousands of course registrations, and has served both as an independent certification and as a pathway into the online MS Analytics program.
3. TeamBuilder software: (Modified open-source online dating software to enable ISyE Senior Design students to match themselves with complementary teammates. The

number of teams self-reporting significant discord was been cut in half, and the software has been disseminated to other universities.

4. * Currently creating free online course in optimization for Gurobi Optimization (consulting)

EDUCATION-RELATED TELEVISION, RADIO, INTERNET, AND PRINT MEDIA APPEARANCES

Quoted/cited regarding education by *Forbes*, *Fortune* online, Hacker News, *Inside Higher Ed*, NPR, TechTarget.com, TowardsDataScience.com, *US News and World Report*

ONLINE EDUCATIONAL MATERIAL DEVELOPMENT

1. ISYE 6501 Introduction to Analytics Modeling, 2017: Created entire online course content, structure, assessments, etc. for core course; delivered course online every semester since Summer 2017, often with more than 1000 students at a time

2. CSE/ISYE/MGT 6748 Applied Analytics Practicum, 2018: Designed structure of required capstone course online; have overseen course online every semester since Spring 2018, usually with hundreds of students each semester

3. Designed interactive capacitated network design and traveling salesman problem applications, 1997. (With K. Croxton, T.L. Magnanti, Y. Wang) Was sole supervisor of the creation of an updated and improved version.

4. Created multimedia web-based linear and integer programming tutorial, including instructional material, 1996. (With K. Croxton, T.L. Magnanti, Y. Wang)

SELECTED EDUCATION SERVICE

1. USG Data Science Regents' Advisory Committee, 2021-present

2. Institute Undergraduate Curriculum Committee, 2020-present; Chair 2021-present

3. Volunteer elementary school math enrichment instructor at local school, 2016-present

4. Associate Editor, *INFORMS Transactions on Education*, 2007 – present

5. U.S. Department of Education Federal Student Aid Analytics Center of Excellence Assessment Committee, 2021-2022

6. Faculty Learning Community on assessment of online education, 2020-2022

7. UC Berkeley Masters of Analytics program proposal reviewer, 2021

8. Chair, ISyE Undergraduate Committee, Fall 2003-2005, Fall 2007-2009, Fall 2010-2011, Fall 2012-2013, Fall 2018-2020; Member, Fall 2002-2006, Fall 2007-2017, Fall 2018-2022

9. Panelist in "Keep Teaching" online advice session for faculty during COVID-19 switch to remote education, 2020

10. Invited Track co-Chair, Engineering Education for IISE Annual Conference, 2019

11. University of Nebraska-Omaha Master of Science in Data Science program proposal reviewer, 2019

12. Faculty Council on Data Science and Engineering, 2014-2018

13. Chair, Editor-in-Chief Search Committee for *INFORMS Transactions on Education*, 2015

14. INFORMS Vice President for Education, 2011-2014

15. Speaker/instructor, ISyE/GT's teacher training for Fulton and DeKalb county math teachers, 2010-2011

16. Co-Chair, INFORMS Teaching Effectiveness Colloquium, 2010

17. Editorial Board, *INFORMS Transactions on Education* special issue on teaching revenue management

18. Editor, *OR/MS Today* "Issues in Education" column, 2003 – 2007

In this reflexive statement, I present my philosophy of successful online education both at the program level and at the course level, and how I have demonstrated that philosophy in my online program development, course development, and teaching.

At the program level, I believe online learning is all about **opportunity**: a way for us to open doors to learners of all ages, all locations, all economic strata, etc.

I designed the Online MS in Analytics degree program (OMSA) and our edX MicroMasters certificate (MM) with that in mind. For a small fraction of the campus cost, students can earn GT's top-quality analytics/data science degree even while working and/or managing family, community, and other responsibilities. OMSA is maximally inclusive: we give an opportunity to *every* applicant who seems likely to be able to succeed. There are currently 5500-6000 OMSA students and 2400+ alumni (now growing by more than 1000 new alumni per year) from over 140 countries and on every continent (including Antarctica!), from age 16 to 84. The Spring 2023 applications I read include 37% women, 18% URMs, and 26% first-generation college students, all much higher fractions than comparable campus programs (including GT's). We also find that many more OMSA students have had to work while in college, have attended college later in life, have lower incomes when applying, etc. – all indications that OMSA is opening doors for lower-income students as well.

OMSA also opens the door for students who have lots of talent but don't have a strong application and/or don't have a strong technical background. The "MicroMasters" credential I designed on edX gives anyone (no application needed) an opportunity to prove themselves before applying, and I was PI on a small internal grant for the development of OMSA prerequisite courses that can be taken online to ensure that students from all backgrounds can be prepared for OMSA and to help them succeed in the program.

Every semester I get messages from new OMSA graduates thanking us for giving them this opportunity. Anecdotally, a few of my favorite OMSA-opportunity success stories include a URM student from Jamaica who would not have been admitted to a standard on-campus GT degree, but proved himself via the MM pathway, completed OMSA with distinction, and is now here on campus in a GT PhD program; a first-generation college student from rural Georgia who wouldn't have considered graduate school due to the cost, if not for OMSA; a top female URM student who was admitted to our campus MSA program and others but couldn't afford any of them, so she chose OMSA as her route to success; and a professional ballet dancer with lots of raw talent but without much quantitative or computing background, who took advantage of our preparatory coursework, then completed OMSA, and now gives back to the program by serving as a teaching assistant in the OMSA capstone practicum course. These are just a few examples of the many (many!) among our 2400+ graduates.

Overall, I believe OMSA and MM together have quietly been one of GT's biggest DEI successes, and I am proud to have been a finalist for the edX Prize for Exceptional Contributions to Online Teaching and Learning based on OMSA and MM.

At the individual course level, I believe the key to outstanding online education is **engagement**. Both the literature and our internal record-keeping shows that if students are engaged in a course outside of just lessons, assignments, and assessments, they are more likely to complete (and learn and apply knowledge from) a course, and an entire degree program.

In my introductory core course (ISYE 6501 Introduction to Analytics Modeling) engagement is especially important, both for learning in the course itself and because it is the first course that most OMSA and MM students take, so it sets their impression of the whole program.

To engage students with each other and with me and TAs, I use weekly discussion questions on Piazza where students lead the discussions and the TAs and I contribute as needed, and then sum up at the end. In addition, I encourage students to Post questions and comments and to discuss with each other both on the official Piazza boards, and on the unofficial student-run course and program Slack channels. I also require each student to peer review and provide comments about three other students' homework each week, as another way to get them interacting with each other. As a result, many 6501 students have gotten so involved in the course that they have volunteered to return as TAs for future semesters; some TAs have stayed connected for years, including one who has been an ISYE 6501 TA for 15 consecutive semesters!

Engagement with the material is also very important. I believe that students who treat the material as more than just a set of learning videos are more likely to learn it, enjoy it, and apply it. So, I use several approaches to enhance learning. First, I try to demystify complex jargon (for example, how the "infinity norm" of a set of numbers is just equal to the "largest" of them) – the more they realize that they understand the complex-sounding material, the more they stay engaged and interested. Second, because humor helps people remember, I try to engage students by injecting some humor to help explain or solidify technical concepts. The most common things graduating students say they remember clearly from my course are the humorous lessons: applying different support vector machine models when I explore the woods with my kids and find mushrooms, my image getting smothered by a couple dozen confusion-matrix formulae to make the point that if they understand a few basic principles they don't need to memorize all the easy-to-confuse equations, how to easily visualize classification and regression trees (and random forests) by rotating the world, etc.

Finally, engagement outside of class material is especially important with older learners (the average student age in ISYE 6501 is mid-30s) who are learning concepts one day and applying them at work the next. Every semester, students ask how to use or extend course concepts to their work situations, and I am always happy to help. This is a key type of engagement; it brings the usefulness of the course material (and the program overall) home and encourages students to stick with the degree and learn even more that they can use professionally.

Engaged, learning students are key for a successful course, and every semester my CIOS scores demonstrate that (even in courses with more than 1000 students). As a result of the success of my course, I placed 3rd internationally for the AECT Distance Education Award.

This document summarizes some of the innovative teaching practices in the two online courses Dr. Sokol teaches, including specific emphasis on the course design. With such large courses (e.g., he has taught online ISYE 6501 to over 13,000 students in the past six years) designing all aspects of a course to promote learning is especially crucial. This document summarizes 1-2 such aspects of each of the two courses (ISYE 6501 Introduction to Analytics Modeling and CSE/ISYE/MGT 6748 Applied Analytics Practicum, the first and last courses in the OMSA program).

ISYE 6501 Introduction to Analytics Modeling

This core course is a survey of many different analytics/data-science models and cross-cutting techniques. The biggest takeaways for students are learning what type(s) of models are appropriate to answer different types of analytics/data-science questions, and how to use them individually or in combination. While they also learn some detail about each model, it's easy once they're analytics/data-science professionals for them to google details of an appropriate method if they forget, but it's much harder to google a situation to figure out what model(s) to use. [In fact, this philosophy is used in many interviews too, which is why so many students say the course is very helpful in answering interview questions.] Therefore, the course is divided into modeling, cross-cutting, and experiential pieces. Each week for the first part of the course there is a new set of modeling and cross-cutting lessons, supplemented by an experiential homework assignment where students implement the model(s) and technique(s) they learned that week – not just mechanically, but with the requirement to *use* those implementations to analyze a data set and draw conclusions or answer questions about it. Because modeling can be done in so many ways[1] it is important for students to see more than just their approach and a set of sample solutions, so it is required for every student to peer review three other students' implementations and analysis – that way, they get to see five different approaches (their own, three other students', and the instructor's) and learn from all of them. Then, in the last part of the course, the focus switches to case studies – each week students discuss an analytics/data-science case and work out ways of combining multiple analytics/data-science models to create a complete solution to the case's question. In the process, the cases (and some of the earlier homeworks) also cover professional situations like what to do if the premise of a question itself seems incorrect, dealing with the ethics and technical aspects of sets of personal data, the need to be true to one's analysis and to avoid unintentional bias, etc.

To encourage learning and experimentation, homework in the course is graded on a 100/90/75/50/0 scale. The course grade scale means that students spend more time thinking and less time trying to squeeze out every last fraction of a point. The default grade is 90, for students who answer the question(s) straightforwardly with a solution and analysis that is mostly or entirely correct. On the other hand, a grade of 100 is earned only by students whose

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[1] One of the final lessons in the course describes a research experiment where 29 teams of analytics/data-science professionals were given the same data set and the same question, and asked to find an answer. All 29 teams built different models and got different answers; in fact, they didn't even use the same subsets of the data!

analysis is more thoughtful and goes above and beyond the norm. It provides a strong incentive for students to really think about how the situation and the technical pieces interact, and it works: most students try for the 100, about 1/3 of students achieve it (about 5/6 of the rest earn a 90), and the large majority of them have a great learning experience in making the effort.

CSE/ISYE/MGT 6748 Applied Analytics Practicum

In this capstone course, each student completes a significant analytics/data-science project for a company or organization that cares about the result right now. Each student interacts with the company or organization, as well as having Dr. Sokol and teaching assistants to ask for technical and professional advice. Creating the infrastructure for a hands-on online capstone course where each of 300, 400, or more students has an individual project, was a significant organizational challenge involving coordination between Dr. Sokol, the Director of MSA Career Services, the GTPE Student Services group, and a set of specialized of teaching assistants. In the end, all of these people are working together to help students find projects, assign students to projects based on preferences, coordinate weekly office hours with company/organization representatives (and office hours with the instructional team), advise students on technical and professional matters, evaluate and give feedback on reports, track project contacts, and receive and compile sponsor feedback for hundreds of projects each semester. The structure (and infrastructure) required is different from on-campus capstone courses, and to our knowledge has not been done online at this scale before.

The design of the supplementary professional material to accompany the project work is also different. The course includes professional modules on creative solutions, leadership, organizational change management, privacy/ethics and law, persuasive speaking, value creation, preparing for new environments, etc. Because the course is online, Dr. Sokol was able to tap his professional network so the students can learn from world-class experts in each of those areas. For example, the privacy/ethics and law module is taught by an advisor to two US Presidents on that topic, the leadership module is taught by a retired 2-star US Army General, the organizational change module is taught by a Major League Baseball executive who helped lead analytics adoption in two MLB teams that then won the World Series, the creative solutions module is taught by the Chief Analytics Officer of a Fortune-500 company (top-50 Most Admired worldwide), the persuasive speaking module is taught by the president of a speech-coaching firm, etc. The fact that this is an online course allowed Dr. Sokol to arrange these outstanding resources for our students, which has really changed the complexion of the professionalism modules and created a much better learning experience for our studen

George Ulysses Soulellis

8380 Greensboro Drive, Unit 221

McLean , VA, 22102

August 15, 2022

Robert Foster Cherry Award Committee

Baylor University

Waco, TX, 76706

Dear Committee members:

It is with great pleasure that I provide this letter of recommendation for Professor Joel Sokol, of the Georgia Institute of Technology, in support of his nomination for the Robert Foster Cherry Award for Great Teaching.

By way of introduction, I currently serve as the Enterprise Model Risk Officer for Freddie Mac, based in McLean, VA. My responsibilities include overseeing the predictive models at the company and I manage a large team of employees with advanced, quantitative degrees and STEM related backgrounds. Prior to Freddie Mac, I served for eight years as the Managing Director for Risk Analytics at Barclays Bank based in London, UK. All in all, I have held multiple senior level roles in the financial industry over the last twenty years – and all within the field of predictive analytics. Throughout my career, I have always exhibited a passion for analytics and have always felt the need to stay abreast of the latest and emerging trends – both in industry and in academia; my long-held belief is that learning represents a continuous journey in life. As a result, I often enroll in various classes (across different institutions) to stay connected to the field.

One course, that I recently completed in December 2019, was 'Intro to Analytics Modelling' with Professor Sokol. The course was dedicated to providing the student with a plethora of modelling techniques within the descriptive, predictive and prescriptive analytics space. And although it was delivered online, I cannot emphasize enough what a tremendous impression the course, but more importantly, Professor Sokol, left on me. From espousing the utmost need for ethics within analytics to injecting humor at many a turn, the course content and delivery was a joy to experience. Professor Sokol connects with his students in a way that brings analytic modelling techniques to life by drawing analogies from real world problems. His unique use of examples helps transform a difficult, abstract subject to something understandable and, just as importantly, practically applicable. His message is one of positivity, always encouraging the use of analytics for good in society. One example from the course elaborated on analytics in the use of financial fair lending and supported this concept perfectly. I also remember Professor Sokol expounding on the virtues of simplicity in modelling techniques with the rationale that

simplicity promotes interpretability and thus confidence amongst stakeholders or users of the model. These are important philosophies and words of wisdom that I have usually encountered in the boardroom but rarely in the classroom.

I would be remiss to not mention the importance of humor. There are many professors who are subject matter experts and technically adept but cannot easily convey that of which they know; for teaching is truly an art and if a professor can convey concepts with a humorous touch, they can capture the imagination of their students and serve as an inspiration. I will never forget the lecture on correlation vs. causation where Professor Sokol ran down a list of phenomena that were correlated but clearly had nothing to do with one another from a cause and effect standpoint; for example, the very strong relationship between the per capita consumption of mozzarella cheese and the number of civil engineering doctorates awarded! I remember I was so enthused I could not wait for the next lecture!

I am currently co-authoring a book on modelling within the financial industry and several aspects of the course actually had me thinking more deeply on a variety of topics. Dr. Sokol's presentation of support vector machine methods and change detection techniques, in particular, helped me frame and further explore these within the book – with the lecture on support vector machines inspiring me to adopt this technique within a proposed multi-model predictive approach.

All in all, I have had countless conversations about analytic concepts both professionally and within the classroom throughout my life. I can honestly say that Dr. Sokol is one of the very few professors or individuals that left such an overwhelmingly positive impression on me. His combination of technical know-how, ability to communicate and inspire, use of humor and strong, ethical principles make him the epitome of a great teacher and educator. He has inspired me to continue taking classes in the Analytics program at Georgia Tech and it is an absolute honor to recommend him for this Award.

Sincerely,

George Ulysses Soulellis

George Ulysses Soulellis

Enterprise Model Risk Officer

Freddie Mac

Note: Please note that the views expressed above are my own and do not necessarily represent the views of Freddie Mac or its Board of Directors

National Aeronautics and
Space Administration
Langley Research Center
Hampton, VA 23681-0001

July 18, 2022

Dear Sirs:

It's a sincere honor to support the nomination of Dr. Joel Sokol to receive the Robert Forest Cherry Award for Great Teaching. I have known Dr. Sokol since the summer of 2017 when I enrolled in the inaugural class of Georgia Tech's Online Master of Science in Analytics (OMSA) program.

I believe I have a unique perspective onto the many facets of Dr. Sokol's profound impact on Data Science education.   I have interacted with him as an OMSA participant, as a student in his class, as a student rep, as a practicum advisee, and as an industry business partner.

Dr. Sokol was a founding father of the OMSA program. His leadership and charisma united three diverse schools to create the innovative online program: Industrial Systems Engineering, Computer Science, and the College of Business. His interdisciplinary approach brought a comprehensive 360° view to the curriculum and was one of the key reasons I selected Georgia Tech.

My first OMSA course, *Introduction to Analytics Modeling*, was taught by Dr. Sokol. His class was a thoughtful balance of theory, application and cross-cutting concepts. He made the subject real for us with many examples of his applied research in sports and medicine. At the same time, he drilled down deeply to the theoretical bedrock. His lectures were inspirational; I felt like a kid in a candy shop, just thinking of all the interesting subjects I would soon be learning.

As I took other courses, Dr. Sokol remained interested and supportive of my progress. He met with me personally to encourage my interest in helping with new student outreach and orientation. As my practicum advisor, Dr. Sokol helped me land a dream job as a Data Science intern at NASA's Langley Research Center. When my internship became a permanent job, Dr. Sokol helped me link NASA with Georgia Tech's Aerospace Systems Design Lab to collaborate on a joint "Smart Center" research project.

Finally, Dr. Sokol kindly accepted my invitation to visit NASA Langley in July 2019. He presented to our researchers on the use of machine learning to improve organ transplant outcomes. Our informal discussions after his lecture led to further GT/NASA research on eye-tracking and human cognitive states, which continues to this day.

The breadth of engagement that Dr. Sokol has had with me and other students is astounding. I don't know where he finds the time and energy. Being active on so many fronts is a signature strength and no doubt key to his many contributions. Dr. Sokol is himself interdisciplinary and cross-cutting. He is the "glue" that attracts and integrates the efforts of so many others. He is truly a Renaissance man.

In summary, Dr. Joel Sokol is an inspiring teacher, a trusted advisor, a diligent researcher and an accomplished lecturer. He is redefining how Data Science is being taught at the graduate level. I am 100% confident that he would reflect well on the prestigiousness of the Robert Forest Cherry Award for Great Teaching.

Sincerely,

Douglas Trent
Senior Data Scientist, Office of the Chief Information Officer
NASA Langley Research Center
BS Electr Engr, MS Comp Sci, Global MBA, MS Analytics

To Whom it May Concern:

I am writing to recommend Dr. Joel Sokol for the Robert Foster Cherry Award.

As an undergraduate Industrial Engineering graduate from Georgia Tech in 2005, I have had the pleasure of knowing Dr. Sokol for over 15 years.   Most recently, I had the pleasure of completing my Masters in Analytics from Georgia Tech in April.   Throughout that time, I have seen Dr. Sokol as more than just one of the best professors I have ever had, but more importantly as a mentor and a friend and a valuable leader in the business community.

Dr. Sokol has a unique ability to translate complex statistics, analytics, and probability theory into simple to understand models for his students. He blends the art of including theory with real world application that is so critical in today's complex business environment. More important than that, Dr. Sokol is always willing to lend a hand to his students, inspiring them and helping stimulate their curiosity. His lectures are well known to be some of the best – even in an online environment, Joel's classes routinely "sell out" and are top rated for being challenging yet inspiring to help you learn the complex world of analytics. Joel gets an A+ in terms of ability to inspire and teach complex topics.

One example of how Dr. Sokol continues to inspire his students is when I, nearly 13 years after graduating from Georgia Tech, was exploring the possibility of getting my Masters in Analytics. This is a program that Dr. Sokol founded that gives access to a top ten online curriculum at a fraction of the cost. The program is allowing people from all over the world to open new doors with a top rated educational program and should be commended in and of itself.   I reached out to Dr. Sokol and asked him for his advice on the program. He graciously responded and we had lunch together to discuss my aspirations and what I was looking to do. In that discussion, I shared my passion to help cure childhood cancer as my daughter Melissa had passed away due to leukemia in 2015. Dr. Sokol not only connected me to the right curriculum to learn more about bio informatics but also connected me with his peer group who are experts in the medical field. This is the type of positive and inspirational leaders we need in our educational communities. Joel leaves a lifelong and lasting impact on his students.

Another example of Joel going above and beyond is after my first masters course where I actually was in his introduction to analytics class, and I was very overwhelmed. Trying to balance a challenging job, and two children at home, on top of reminding myself how to study and go to school again virtually had me completely overwhelmed and exhausted. So overwhelmed that I wrote Joel an email and said I thought I needed to quit – I couldn't handle the workload and pressure. Joel encouraged me to take a breath, pointed me to a few study groups that helped me, and most importantly encouraged me to give it a semester and then make a decision. Sure enough, I started to get the hang of the program. Not only did I get the hang of it, I started to love learning again. I was learning complex analytic algorithms that I use for my work everyday. I was immediately communicating in a way that showed my level of expertise to my peers and clients. And most importantly, I was having fun learning again. While the program was very challenging, I learned more than I could ever imagine and credit Joel for helping encourage me along the way and most importantly always being there for his students.

Lastly, as a Senior Managing Director and Applied Intelligence Lead for Europe at Accenture, I have had the pleasure of having many guest speakers talk to our C-level clients. I have also had Dr. Sokol serve as guest lecturer and panelist for several initiatives around AI. Most recently, I had Joel speak to over 20 Chief Analytics Officers and executives from Fortune 100 companies at one of my round tables. Dr. Sokol demonstrated an amazing capability around demand sensing that was a hit for the business community. This combination of being able to be a strong professor, care for his students, but also have a large impact on the business community is a rare combination that makes Dr. Sokol a top pick for the Robert Foster Cherry Award.

Please let me know if you have any questions.

Joe Depa
Senior Managing Director
Applied Intelligence Lead Europe
Accenture
404.402.2472

Joel Sokol – CIOS scores for online teaching

Graduate courses (online)

Semester	Course	Enrolled (OSCAR)[1]	Enrolled (CIOS)	Responded	"Effective Teacher"[2]
Fall 2017	ISYE 6501 Introduction to Analytics Modeling	137			
Spring 2018	ISYE 6501 Introduction to Analytics Modeling	301			
Summer 2018	ISYE 6501 Introduction to Analytics Modeling	79	*CIOS was not used for OMSA courses (other than the practicum) until Fall 2019*		
Fall 2018	ISYE 6501 Introduction to Analytics Modeling	396			
Spring 2019	ISYE 6501 Introduction to Analytics Modeling	582			
Summer 2019	ISYE 6501 Introduction to Analytics Modeling	154			
Fall 2019	ISYE 6501 Introduction to Analytics Modeling	923	924	265	4.8
Spring 2020	ISYE 6501 Introduction to Analytics Modeling	855	*Course not surveyed due to COVID*		
Summer 2020	ISYE 6501 Introduction to Analytics Modeling	336	309	59	4.8
Fall 2020	ISYE 6501 Introduction to Analytics Modeling	1,273	1,155	338	4.7
Spring 2021	ISYE 6501 Introduction to Analytics Modeling	1,059	935	258	4.7
Summer 2021	ISYE 6501 Introduction to Analytics Modeling	358	325	74	4.7
Fall 2021	ISYE 6501 Introduction to Analytics Modeling	1,092	986	303	4.6
Spring 2022	ISYE 6501 Introduction to Analytics Modeling	1,032	917	260	4.7
Summer 2022	ISYE 6501 Introduction to Analytics Modeling	281	272	56	4.7
Fall 2022	ISYE 6501 Introduction to Analytics Modeling	1,114	992	191	4.6
Spring 2023	ISYE 6501 Introduction to Analytics Modeling	811	*Course still in progress*		
TOTAL		**10,783**			**4.7**

Analytics Capstone courses (online)

Semester	Course	Enrolled (OSCAR)	Enrolled (CIOS)	Responded	"Effective Teacher"
Summer 2018	CSE/ISYE/MGT 6748 Applied Analytics Practicum	1	1	0	*n/a*
Fall 2018	CSE/ISYE/MGT 6748 Applied Analytics Practicum	6	5	1	*Instructor questions not asked*
Spring 2019	CSE/ISYE/MGT 6748 Applied Analytics Practicum	29	16[3]	5	
Summer 2019	CSE/ISYE/MGT 6748 Applied Analytics Practicum	89	53[4]	15	4.7
Fall 2019	CSE/ISYE/MGT 6748 Applied Analytics Practicum	55	55	8	4.3
Spring 2020	CSE/ISYE/MGT 6748 Applied Analytics Practicum	110	*Course not surveyed due to COVID*		
Summer 2020	CSE/ISYE/MGT 6748 Applied Analytics Practicum	191	186	39	4.6
Fall 2020	CSE/ISYE/MGT 6748 Applied Analytics Practicum	183	184	55	4.6
Spring 2021	CSE/ISYE/MGT 6748 Applied Analytics Practicum	273	282	78	4.7

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[1] Oscar's enrollment numbers appear different from CIOS's enrollment numbers. Looking at assignments turned in, the Oscar numbers seem more accurate.

[2] Georgia Tech does not publish norms for classes of this size (the highest category is "99+" and does not include OMS courses). The only other 1000+ person courses on OSCAR appear to be CSE 6040 (Fall 2020, Spring 2021, Fall 2021), CS 7646 (Fall 2021, Spring 2022), and CSE 6242 (Fall 2020, Spring 2021, Fall 2021, Spring 2022) and Dr. Sokol's average CIOS scores are higher than those of the other instructors.
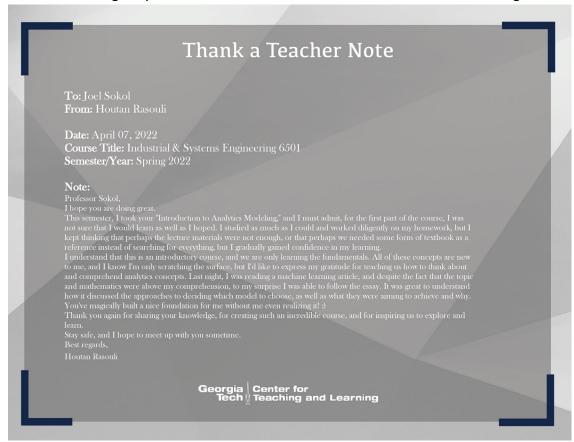
[3] The CIOS enrollment numbers are significantly lower because CSE 6748 and MGT 6748 were surveyed in CIOS, but ISYE 6748 was not surveyed.

Summer 2021	CSE/ISYE/MGT 6748 Applied Analytics Practicum	325	321	79	4.5
Fall 2021	CSE/ISYE/MGT 6748 Applied Analytics Practicum	214	212	58	4.6
Spring 2022	CSE/ISYE/MGT 6748 Applied Analytics Practicum	349	351	91	4.2
Summer 2022	CSE/ISYE/MGT 6748 Applied Analytics Practicum	404	400	118	4.6
Fall 2022	CSE/ISYE/MGT 6748 Applied Analytics Practicum	342	338	84	4.5
Spring 2023	CSE/ISYE/MGT 6748 Applied Analytics Practicum	426	*Course still in progress*		
TOTAL		**2,997**			**4.5**

MicroMasters courses (online – not surveyed by CIOS)

Semester	Course	Enrolled (Audit)	Enrolled (MM)
Summer 2017	ISYE 6501 Introduction to Analytics Modeling	13,576	166
Fall 2017	ISYE 6501 Introduction to Analytics Modeling	5,580	97
Spring 2018	ISYE 6501 Introduction to Analytics Modeling	2,881	96
Summer 2018	ISYE 6501 Introduction to Analytics Modeling	7,198	237
Fall 2018	ISYE 6501 Introduction to Analytics Modeling	7,117	177
Spring 2019	ISYE 6501 Introduction to Analytics Modeling	5,310	243
Summer 2019	ISYE 6501 Introduction to Analytics Modeling	3,625	231
Fall 2019	ISYE 6501 Introduction to Analytics Modeling	6,211	275
Spring 2020	ISYE 6501 Introduction to Analytics Modeling	7,197	361
Summer 2020	ISYE 6501 Introduction to Analytics Modeling	6,733	546
Fall 2020	ISYE 6501 Introduction to Analytics Modeling	4,701	465
Spring 2021	ISYE 6501 Introduction to Analytics Modeling	5,479	370
Summer 2021	ISYE 6501 Introduction to Analytics Modeling	2,827	300
Fall 2021	ISYE 6501 Introduction to Analytics Modeling	3,651	187
Spring 2022	ISYE 6501 Introduction to Analytics Modeling	3,135	171
Summer 2022	ISYE 6501 Introduction to Analytics Modeling	2,010	198
Fall 2022	ISYE 6501 Introduction to Analytics Modeling	2,322	148
Spring 2023	ISYE 6501 Introduction to Analytics Modeling	1,602	164
TOTAL		**91,155**	**4,432**

"You've magically built a nice foundation for me without me even realizing it!"

"Isn't the job of a teacher to help students learn how to think for themselves and problem-solve on their own?"