



ONLINE MASTER OF SCIENCE IN COMPUTER SCIENCE

Offered in collaboration with Udacity and AT&T

BEST EDUCATION IN THE WORLD: NOW AVAILABLE TO THE WORLD

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

OMSCS:

What Are We Talking About?

- OMSCS: Online Master of Science in Computer Science
- Collaboration among GT, Udacity & AT&T
- Announced on 5/14/2013
- Program launch 1/15/2014 with 380 students & 5 courses



Here's Where We Are

- 9,622 total graduates todate
- 2,178 total graduates in last academic year
- 50+ graduates in PhD programs
- Fall 2022 enrollment: **12,000** students
- **43+18** courses, more planned

How did it Start?

- November 2011, the first MOOC, AI by Norvig & Thrun
- Early 2012, Coursera and Udacity, a bit later edX
- NYTimes: 2012, the year of the MOOC
- September 2012, Sebastian Thrun's visit
- The process
- January 2013, \$2M from AT&T critically important

Building College Consensus



- Appointed faculty Working Group (September 2012)
- College leadership minimized presence in deliberations
- WG gave 6+ months to project
- Final proposal affirmed by 75% of College faculty (March 2013)
- Main concern: Quality, Quality, Quality
- President & Provost introduced to key Regents & USG officers prior to Board of Regents vote (May 2013)
- Announced (May 2013)
- Launched (January 2014) with 380 students and 5 courses

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Incentives

- Making the course \$30K
- Instructor of record \$10K
- “Royalty” \$2.5K

The OMSCS Motto

Accessibility through Affordability and Technology

- OMSCS total degree cost: ~\$6,800*
- Typical MS CS (public university, out-of-state) ~\$40,000
- Typical MS CS (private university) ~\$70,000
- World's first accredited MOOC-based degree in CS

Rationale – Part 1

- Georgia Tech motto: “Progress & Service”
- College of Computing (CoC) history of educational innovation
- M.S. & CS most natural places to start
- It was the right time for this experiment
 - Rapidly maturing technology
 - Dozen MOOCs with Coursera



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Rationale – Part 2

- Many students want to go beyond learning—they want degrees/credentials
- Larger pool of prospective students (incl. nontraditional)
- Redefine learning experience to be more student-focused
- Address shortage of trained computing professionals
- Address shortage of trained computing teachers

Overall Applications



- More than 50,000 unique applicants, October 2013 to current
- **Admission rate 75%**
- 120 countries represented & all 50 U.S. states
- Majority are working in computing/IT
- 65% domestic applicants—inverse of on-campus MS CS (35%)
- We are expanding the market, not cannibalizing on-campus MS CS program

TWO ONLINE REVOLUTIONS, TWO TALKS

CREATING THE NEXT

Enrollment



- 33,000 unique enrollments since launch (85% yield)
- 12,000 enrolled at start of Fall 2022 semester
- Demographics:
 - Average age: 30 (~8 years older than on-campus MS CS)
 - 61% are U.S. citizens or permanent residents
 - 54 U.S. states/territories & 120 countries represented
 - Among new Spring 2023 students: 19% prior master degree, 6% PhD

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

International Enrollment

On-campus MS CS (Spring 2022)

- Total enrollment: 464
- 1. **India**: 112 (24.1%)
- 2. China: 63 (13.5%)
- 3. Taiwan: 9 (1.9%)

OMSCS (Spring 2022)

- Total: 12,016
- 1. **China**: 1,243 (10.4%)
- 2. India: 953 (8.0%)
- 3. Canada: 206 (1.7%)
- 4. Singapore 162 (1.3%)



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Retention

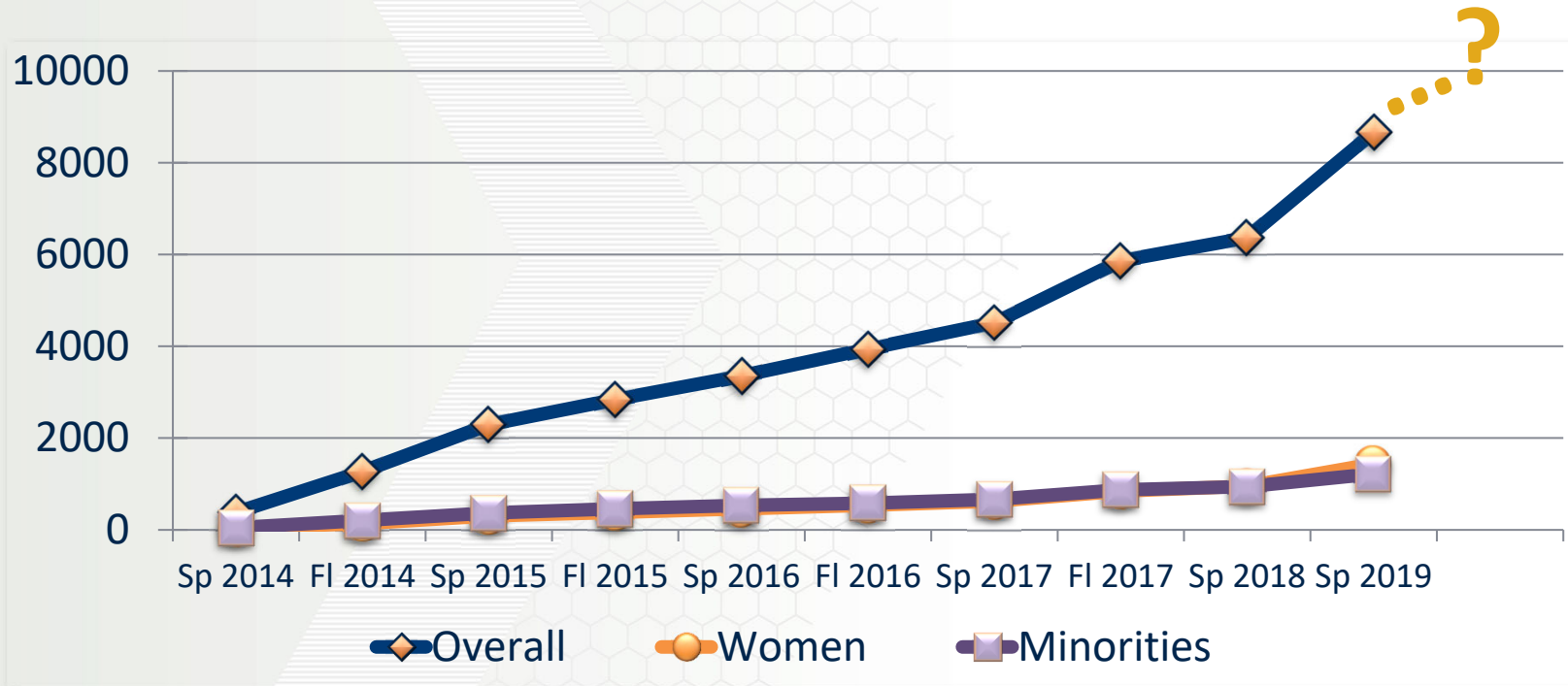
68%

of all matriculating students have graduated or are still enrolled

85%

of students to meet foundational requirement have graduated or are still enrolled

OMSCS – Enrollment Growth



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

OMSCS: Dozens of Student Communities

- reddit – 28,000
- Slack – 13,000
- Facebook – 4,000+
- Twitter – 7,000+



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Showing GT Computing Spirit



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

NYC Sanitation Worker Takes On OMSCS



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

OMSCS Opportunities for Veterans



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Building a Community



A graphic for OMSCS Digital Career Seminars. It features a portrait of Michael Brown, a man with a beard wearing a suit and a red and black checkered bow tie. To the right of the portrait, the text reads: "How OMSCS Can Bolster Your Transition Out of the Military and into Civilian Life" followed by "with Michael Brown - OMSCS Alumnus and U.S. Army Veteran". The graphic also includes a speech bubble icon and the Shindig logo.

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

OMSCS Alumni Survey



97% said it was worth the investment

97% would recommend it to others

81% said it helped their career

48% said it helped them secure a higher salary

36% have joined a new workplace since completing OMSCS

25% have been promoted since completing OMSCS

6% have started teaching CS at either the high school or college level

5% have transitioned into the tech sector from outside of it

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Lessons Learned

- There is a large, unmet demand
- You can't learn from what you don't try
- Students are highly engaged—officially & unofficially
 - Interacting via self-created social media groups
 - Providing significant peer support
- Many students eager to serve as TA's:
 - 104 on-campus TA's
 - 150 OMSCS TA's
 - 191 OMSCS alumni TA's

More Lessons Learned

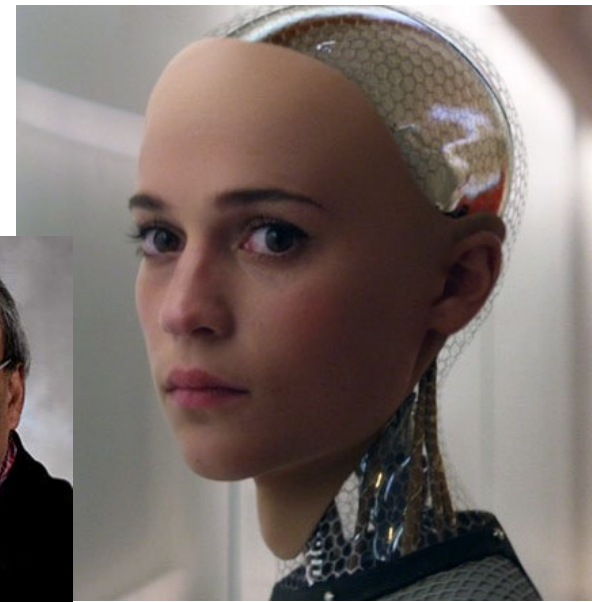
- Online, **students** have control
 - Forum-based classroom empowers students
- OMSCS **students** are uniquely qualified
 - Many employed by companies like Google, Amazon & SpaceX
- Giving uniquely qualified **students** control drastically improves the class for all students
- **Students** in Educational Technology include current teachers; students in Health Informatics include current physicians

Jill Watson: The First AI TA

- Creation of Prof. Ashok Goel
- TA in Knowledge-Based AI
- Based on IBM Watson platform
- Now in 20 classes
- Other projects:
 - online tools
 - plagiarism prevention



Ashok Goel



From the 2015 film, *Ex Machina*

Harvard Study @ OMSCS Shows:



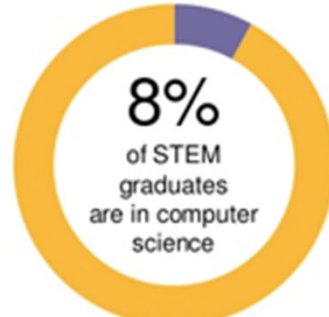
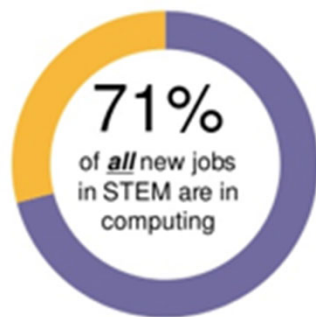
- **“Vast majority of OMSCS students would not pursue advanced degree if not for this program”**
- **“This is the first rigorous evidence that we know of showing an online degree program can increase educational attainment”**
- **“OMSCS is the largest MS CS program in the United States”**
- **“This single program will boost annual national production of American computer science master’s degrees by at least eight percent”**

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Jobs

The STEM problem is in computer science: **Now**

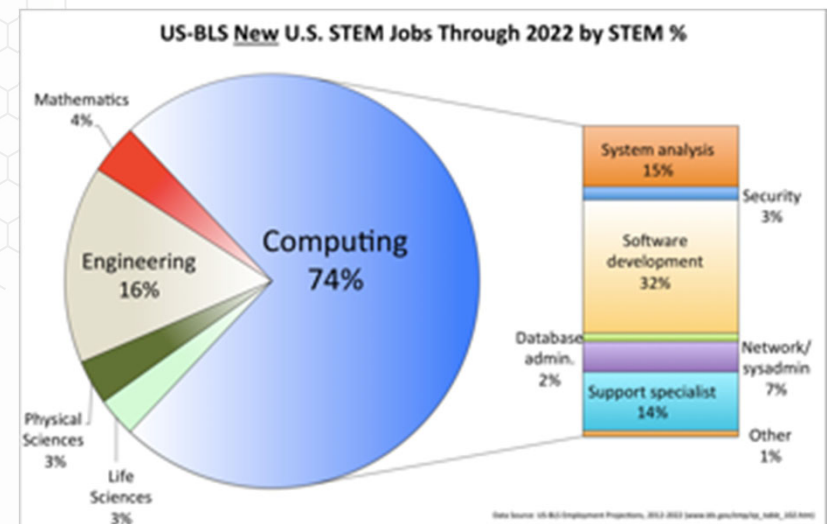


Sources: Bureau of Labor Statistics, National Center for Education Statistics

* U.S. Department of Education, National Center for Education

https://nces.ed.gov/programs/digest/d12/tables/dt12_313.asp

Projection



Impact on Campus Applications



MS CS apps. up >125% first 5 yrs.

- **2014: +30%**
- **2015: +18%**
- **2016: +16%**
- **2017: +13%**
- **2018: +13%**

Undergraduate BS CS up >500% same yrs.

- **2014: +85%**
- **2015: +35%**
- **2016: +31%**
- **2017: +57%**
- **2018: +19%**

Overall BS CS apps. up >1,200% since 2008

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Measuring Success

- ✓ All courses are top quality (and we continually evaluate)
- ✓ Identical online and on-campus assessments
- ✓ Enrollment scales
- ✓ **Financial viability**

Finances

- Net \$15M
- Formula Funding by the State of Georgia
- Increase enrollment → higher budget
- Half to the university, half to the university system
- Total increase in 9 years
- ~100 MILLION DOLLARS a year

Followers in Our Footsteps



University of Illinois (first to follow): iMBA (2015), Data Science, Accounting

Georgia Tech: via edX - OMS Analytics (2017), OMS Cybersecurity (2019)

More than 70 similar online degree programs have been launched since OMSCS was founded by more than 30 universities.

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

Biggest online programs



OMSCS 12,016

OMS Analytics 5,443

iMBA 4,150

OMSCS enrollments = 29% of Georgia Tech's enrollments

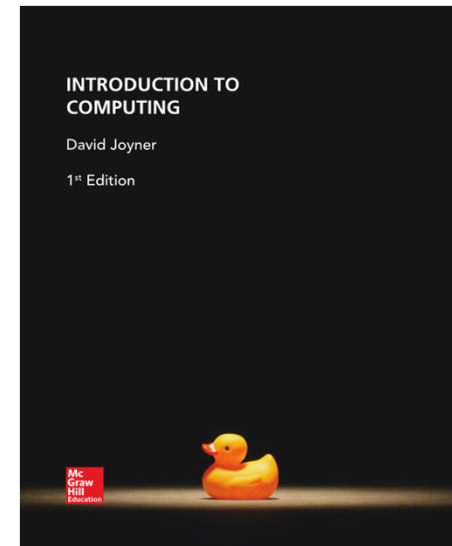
3 OMS programs = 42% of Georgia Tech's enrollments

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

MOOCs Go Undergrad

- Online CS 1301 – Intro to Computing with Python
- Online section optional; ~50% take it online
- Feedback from all online students:
 - 94% say CS1301 is **at least as good** as, 81% **better than** their other college courses
- High school student participation
- MOOC version (so far ~500,000 took it)
- Two more online courses CS1331 (OOP with Java) CS1332 (Algorithms)



Vision

- Can online courses put a dent in college cost?
- Intro courses in high school
- Coursework during coops, internships
- Advanced courses on the job through OMSCS
- Shorten time spent on campus

It all adds up to meaningful reduction in cost of undergraduate education

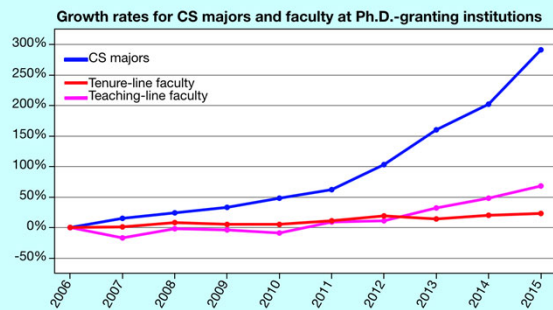


Another Problem to Solve

- Serious shortage of CS professors

Faculty Hiring Lags Behind Demand

- Although institutions have started to hire more faculty in dedicated teaching lines, faculty numbers have not kept pace.



Source: Inside Higher Ed

Solution: Leverage online courses



HtH Kfhzq~

Recognition

OMSCS was awarded first a regional, then a national Program of Excellence Award from the University Professional & Continuing Education Association (UPCEA)

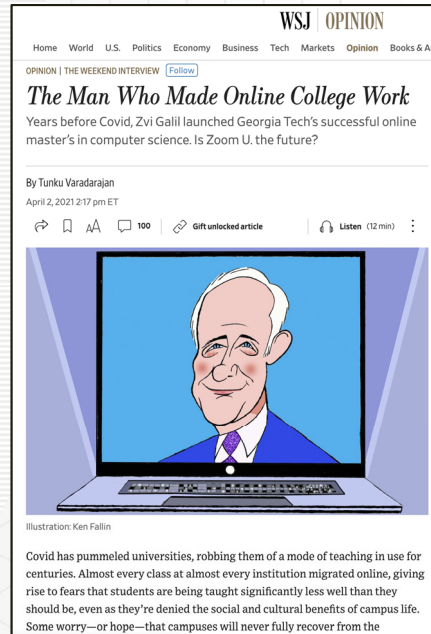
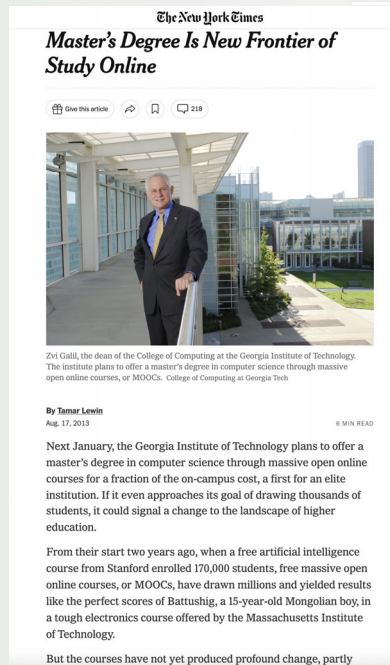
The conference “Reimagine Education” which touts its award program as the “Oscars of Education” awarded OMSCS a gold medal as the “best distributed/online program for nurturing 21st-century skills.”

Georgia Tech named to Fast Company’s list of Most Innovative Companies, due to the success of OMSCS (third university named to the list in ten years)

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

In the Media



IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT

“Perhaps Zvi Galil and Sebastian Thrun will prove to be the **Wright brothers** of MOOCs,” said **S. James Gates Jr.**, a University of Maryland physicist who serves on President Obama’s Council of Advisors on Science and Technology. “This is the first deliberate and thoughtful attempt to apply education technology to bringing instruction to scale. It could be epoch-making. If it really works, it could begin the process of lowering the cost of education, and lowering barriers for millions of Americans.”

“The Rong Brothers”



Zvi Galil



Sebastian Thrun

IMPROVING EDUCATION THROUGH ACCESSIBILITY AND AFFORDABILITY

CREATING THE NEXT