ECU Computer Science

Dr. Qin Ding
Professor and Undergraduate Program Director
Department of Computer Science
phone: 252-328-9686
email: dingq@ecu.edu

Ms. Sarah Joyner
Computer Science Academic Advisor
phone: 252-328-9301
email: joynersa21@ecu.edu

We Want You to Graduate in Four Years

- Meet with academic advisor, Ms. Sarah Joyner (joynersa21@ecu.edu), every term through an appointment
- Complete at least 30 credits per year
- Meet priority course registration deadlines
- Set and follow a four-year degree plan using DegreeWorks
- Meet with Computer Science faculty as needed
- Use Peer Tutoring service
- Participate in extracurricular activities and develop leadership skills

What is Computer Science/ Software Engineering?

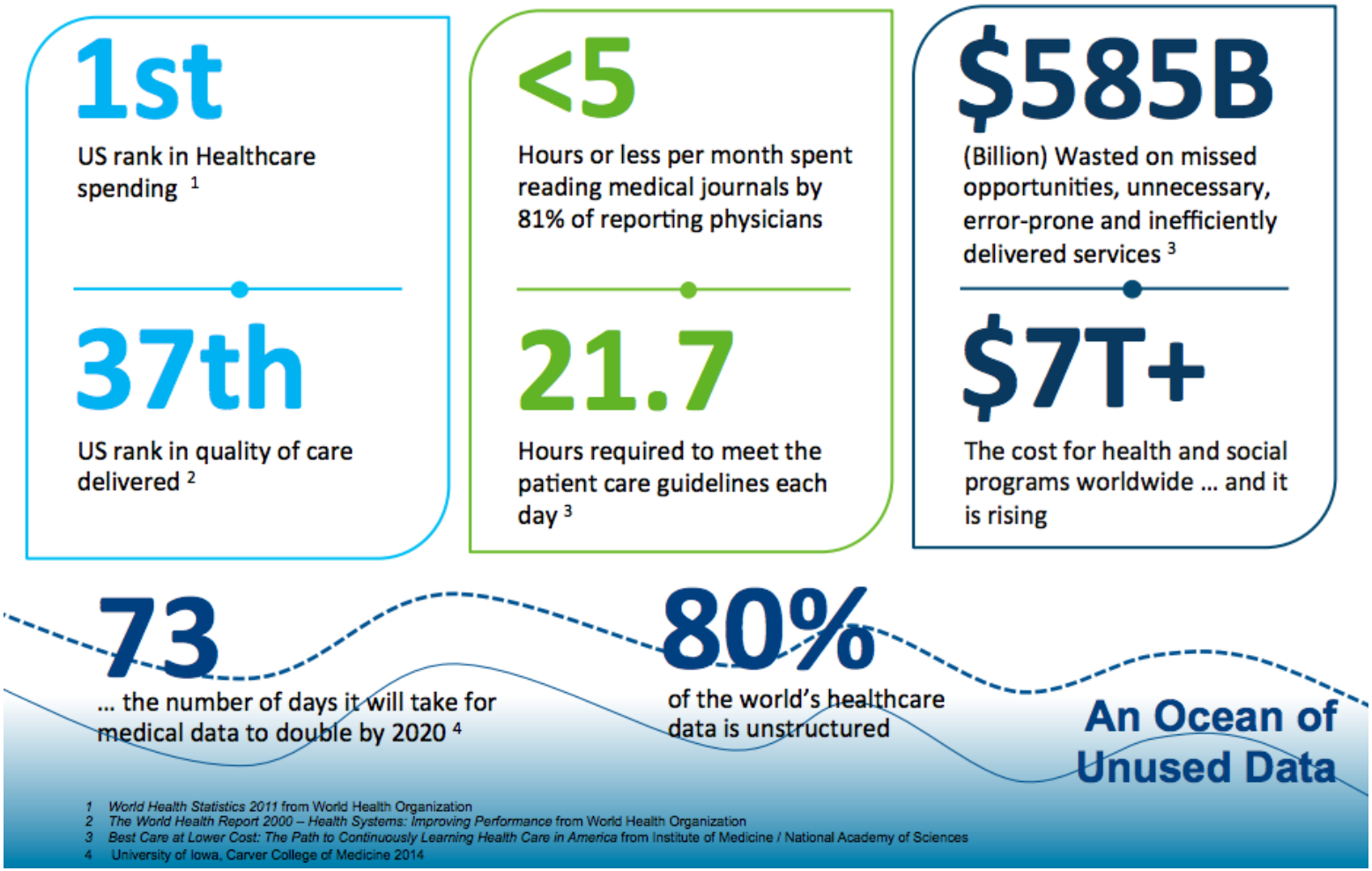
- Computer Science/ Software Engineering is about helping humanity, not just programming.
- Computer Science/ Software Engineering is engineering complex software systems to solve problems that confront humanity.
- Computer Science/ Software Engineering is the new mathematics and engineering for the 21^{st} century.
- Computer Science is the basis for Software Engineering.
- Software Engineering is more applied and adds project, product, and people management to build and operate complex software systems.

What is Computer Science/ Software Engineering?

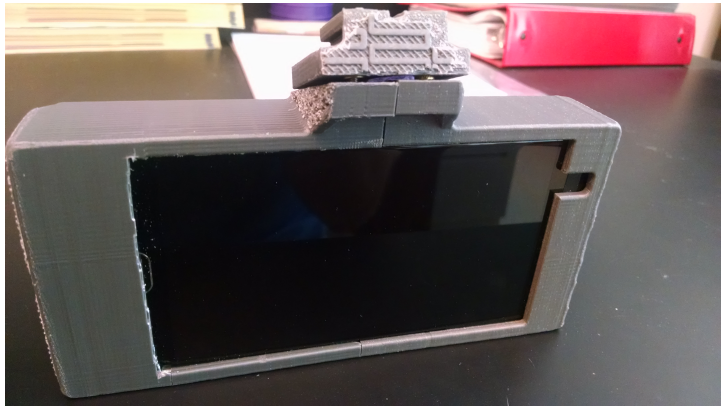
- Drug discovery
- Personalized medicine
- Clean air, water, and energy
- Power grids, transportation infrastructure, high-value manufacturing
- Games, animation, and entertainment
- Increasing crop yield by micro-monitoring irrigation – precision agriculture
- Self-driving cars
- Keyboard $\rightarrow$ Touch Screens $\rightarrow$ Natural Language – Apple Siri, Microsoft Cortana, Amazon Alexa, and Google Now

Natural Language Analysis and Understanding

IBM Watson Healthcare



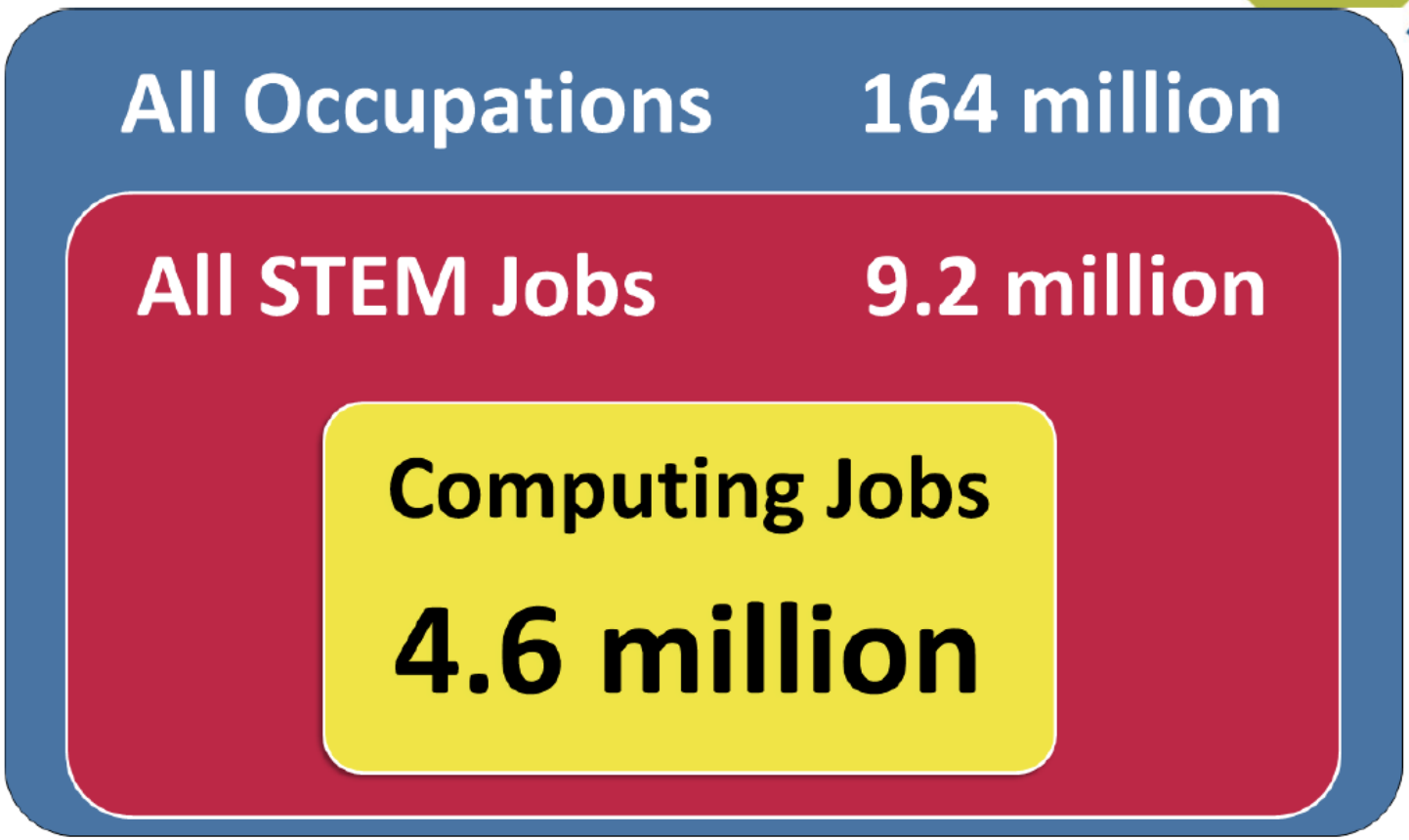
Self-driving Cars



Self-driving Cars

- John Jones' (our department adjunct instructor) self-driving car (level 2 automation)
  `https://www.youtube.com/watch?v=HZBZ0On9hK8`
- comma.ai openpilot open-source software
  `https://github.com/commaai/openpilot`
- Ashlee Vance Homemade Self-Driving Car
  `https://www.youtube.com/watch?v=YuKAmsMg2ZE`

U.S. Workforce through 2020

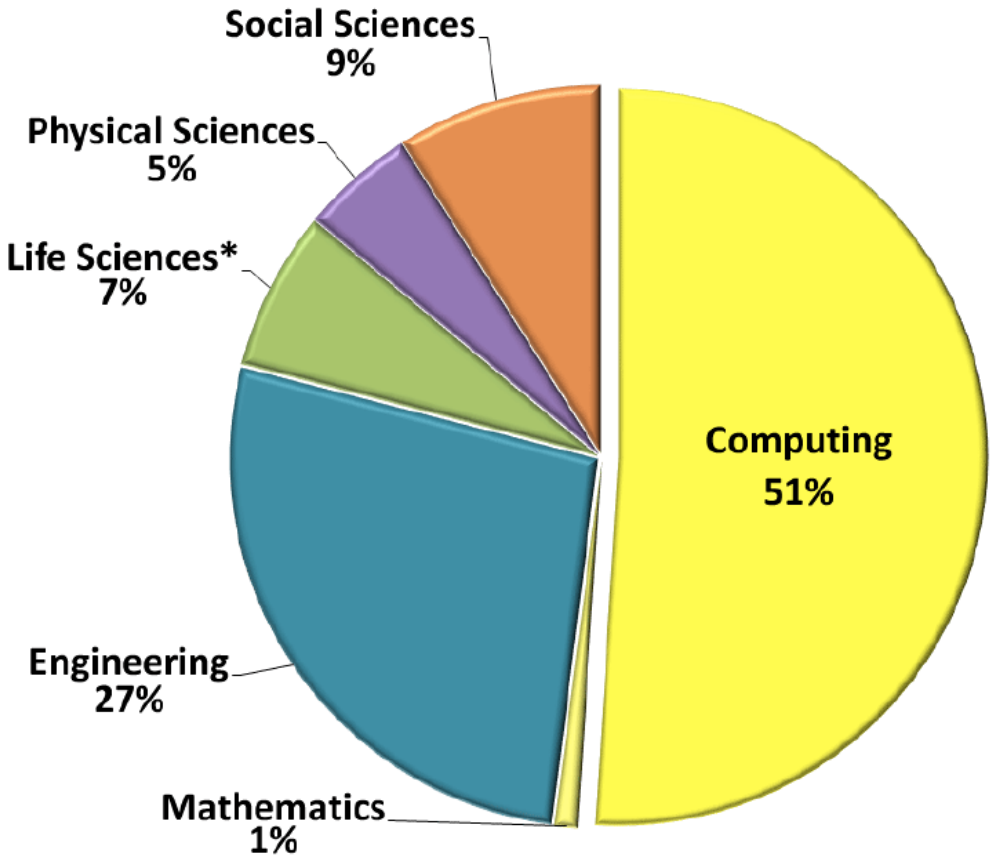


Association for Computing Machinery

Source: Jobs data and mean annual wages are from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, *available at* http://www.bls.gov/emp

Where the STEM Jobs Will Be

Projected Annual Growth of Total STEM Job Openings 2010-2020



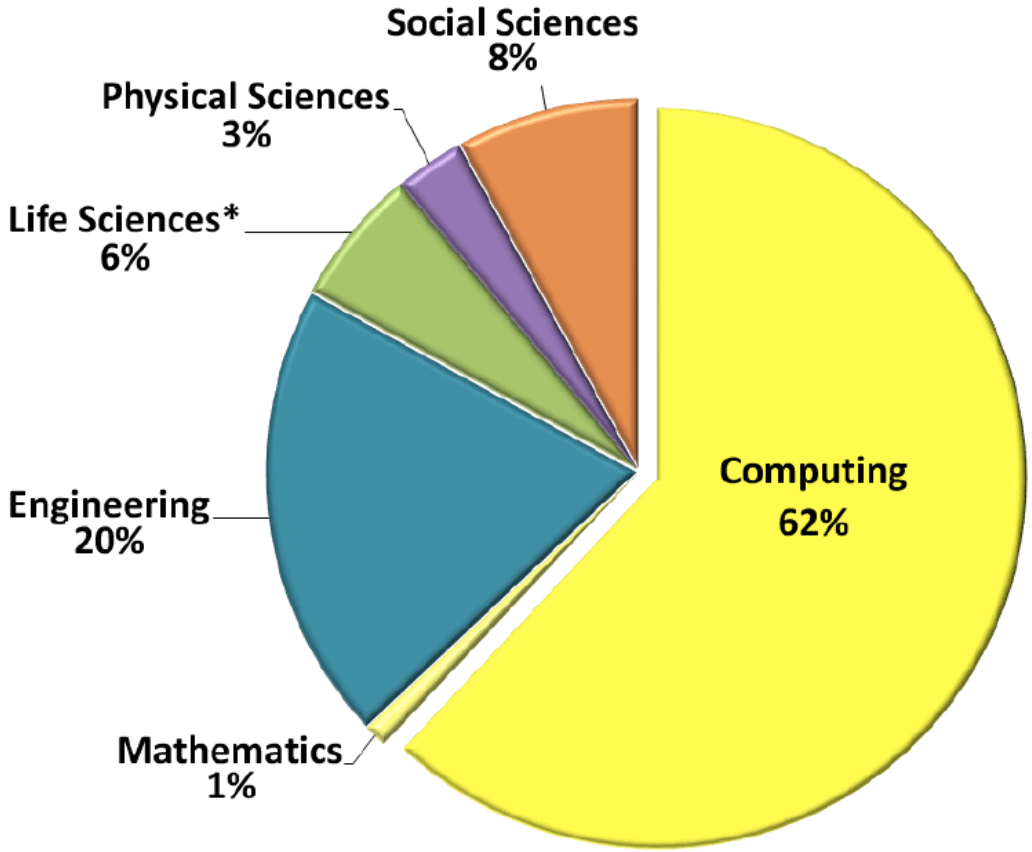
* STEM is defined here to include non-medical occupations.

Association for Computing Machinery

Source: Jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at http://www.bls.gov/emp/.

Where the STEM Jobs Will Be

Projected Annual Growth of NEWLY CREATED STEM Job Openings 2010-2020



* STEM is defined here to include non-medical occupations.

Association for Computing Machinery

Source: Jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at http://www.bls.gov/emp/.

What is it like to be a Computing Professional?

- https://www.youtube.com/watch?v=nKIu9yen5nc&feature=youtu.be

Computer Science/ Software Engineering at ECU

- Student-centered learning environment
- State-of-the-art programs on par with national standards
- In addition to standard core courses, elective courses include Machine Learning, Artificial Intelligence, Natural Language Processing, Information Retrieval, Visual Analytics, Big Data, Cybersecurity, Computer Graphics, and Digital Image Processing
- Theoretical and applied research
- Undergraduate research
- Accelerated B.S. + M.S. degree programs
- Computer Game Development Certificate

Student Activities

- ACM Student Chapter, Women in Technology (WiT)
- ECU REU Program in Software and Data Analytics
- ECU NSF RED Project `https://ppse.ecuresearch.org/`
- Support for research presentations at regional and national conferences
- Paid internships
- Graduates work in a range of organizations including IBM, Microsoft, Google, Ernst & Young, SAS, Bank of America, Fidelity, Credit Suisse, Vanguard, and Duke Energy.
- Close to 100% job placements for graduates

120 SH BSCS Degree

Component	Semester Hours
15 CS Core courses	48
5 CS Electives	15
3 Science Cognates	12
2 Math Cognates	6
Gen Ed (34 + 8 through Science Cognates)	34
Free Electives	5
Total	120

121 SH BSSE Degree

Component	Semester Hours
14 SE Core courses	42
5 SENG/CS Electives	18
3 Science Cognates	12
2 Math Cognates	6
Gen Ed (34 + 8 through Science Cognates)	34
Concentration Courses	9
(Data Science or Mobile and Web Development)	
Total	121

BSCS Core Courses

1. CSCI 1010 - Algorithmic Problem Solving
2. CSCI 1011 - Algorithmic Problem Solving Lab
3. CSCI 2400 - Discrete Structures I
4. CSCI 2405 - Discrete Structures II
5. CSCI 2530 - Algorithms and Data Structures
6. CSCI 2540 - Data Abstraction and Object-Oriented Data Structures
7. CSCI 2410 - Digital Electronics
8. CSCI 3000 - Operating Systems

BSCS Core Courses

9. CSCI 3010 - Computer Networks
10. CSCI 3030 - Software Engineering I
11. CSCI 3584 - Computational Linear Algebra
12. CSCI 3650 - Design and Analysis of Algorithms
13. CSCI 3675 - Organization of Programming Languages
14. CSCI 3700 - Database Management Systems
15. CSCI 4230 - Software Engineering II (Senior capstone)
16. CSCI 4235 - Software Engineering II Lab
17. CSCI 4602 - Automata and Formal Languages

BSSE Core Courses

1. SENG 1000 - Software Engineering Foundations and Practice
2. SENG 1010 - Discrete Structures for Software Engineers I
3. SENG 1020 - Data Structures for Software Engineers
4. SENG 1030 - Discrete Structures for Software Engineers II
5. SENG 2000 - Advanced Data Structures and Algorithms
6. SENG 2010 - Requirements Specification and Analysis
7. SENG 2020 - Linear Algebra for Software Engineers

BSSE Core Courses

8. SENG 3000 - Software Architecture and Design
9. SENG 3010 - Software Construction
10. SENG 3020 - Software Verification and Validation
11. SENG 3700 - Database Design and Development
12. SENG 4500 - Software Engineering Capstone Project I
13. SENG 4510 - Software Engineering Capstone Project II
14. ITEC 3290 - Technical Writing

BSCS/ BSSE Mathematics Cognates

1. MATH 2121/2171 - Calculus
2. MATH 2228 - Statistics or MATH 2283 - Statistics for Business

Select BSCS/ BSSE Elective Courses

1. CSCI 4110 - High Performance Computing
2. CSCI 4120 - Machine Learning
3. CSCI 4130 - Information Retrieval
4. CSCI 4140 - Natural Language Processing
5. CSCI 4150 - Digital Image Processing
6. CSCI 4160 - Cybersecurity: Theory and Practice
7. CSCI 4170 - Cloud Computing
8. CSCI 4180 - Big Data Analytics

Recommended Minors (not required for graduation)

Statistics

Linguistics

Speech and Hearing Sciences

Music

Psychology

Business Administration

Contacts

Ms. Sarah Joyner
Computer Science Academic Advisor
252 - 328 - 9301
joynersa21@ecu.edu

Ms. Traci Brown
Computer Science Administrative Associate
252 - 328 - 9680
lyncht@ecu.edu

Department Website
`http://www.ecu.edu/cs-cet/csci/index.cfm`

Questions?

- What laptop should I buy?

  In the order of preference:

  MacBook Air or MacBook Pro

  Any Linux laptop

  If you already own a Windows laptop, install Linux (e.g., Ubuntu, Fedora, ...) for dual boot mode of operation.