Computing Everywhere

Tuesdays, 7-9 pm
April 5 - May 3, 2016
Annenberg Hall, Room G-28
Mike DeVito, devitom@u.northwestern.edu (admin)
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Course Overview

This course is a series of workshops, designed to improve computational literacy and computational thinking. The course will include a basic introduction to what computation is, and how programs and algorithms work, but will also focus on the social, political, and psychological implications of living in an environment that is often mediated by computation.

Course Goals

The overall goal for the course is to introduce students to computational thinking. This includes moving beyond seeing algorithms and programs as black boxes, and to a conceptual understanding of how computation works, where computation is used, and what some of the benefits and dangers of computation are. We have multiple specific objectives, including:

- Understanding what an algorithm is, and how it differs from a program
- Understanding basic programming principles, such as AND/OR logical operators and loops, and create basic programs in Python
- Understanding the primary technical infrastructure that underlies the Internet / Web, and the implications for how that infrastructure impacts privacy
- Thinking critically about the claims that are made about the implications of technology, through understanding the affordances of technologies
- Thinking critically about the interaction between humans and computation - as both designers and consumers of computation

Course Structure and Student Evaluation

This course is not graded, and there will be no official evaluation.

Instructors

Colin Fitzpatrick is a doctoral candidate in the Technology and Social Behavior PhD Program. His research focuses on selective information disclosure among strangers online.

Robin Brewer is a third year PhD student in the Technology and Social Behavior program. Her research focuses on designing technologies to support online communication for older adults who have limited knowledge of or who do not have access to the Internet.

Matthew Heston is a doctoral student in the Technology and Social Behavior PhD program. He researches how people communicate in online settings.

Jim Maddock is a first year PhD Student in the Technology and Social Behavior program. He studies collaboration, coordination, and information diffusion in online communities such as Wikipedia and Twitter.

Jeremy Foote is a PhD student in the Media, Technology, and Society program. He studies how online projects start, and how people make collective decisions online.

Scott Allen Cambo is a PhD Student in the Technology and Social Behavior program. He studies human-computer interaction with intelligent systems, particularly those used in self-tracking or mobile health.

Mike DeVito is a doctoral student in the Media, Technology, and Society PhD program. His research focuses on user perceptions and informational effects of algorithmically-driven systems.

Workshop Descriptions

1. Sorting out Sorting - Colin Fitzpatrick

This first workshop focuses on understanding algorithms. We begin with a discussion of the algorithms we encounter in our everyday lives. We then build our own algorithms, first without code and eventually with code. We end with a final discussion of considerations in evaluating algorithms.

2. Fundamental Computing - Robin Brewer

Fundamental logic skills are essential for any component of computing such as writing pseudocode, understanding algorithms, or extracting large quantities of data. In this course you will learn how to take decisions and scenarios from everyday experiences and turn them into structures and code that a computer can understand with logical operators (e.g. AND, OR, NOT) conditional statements (e.g. if/else statements) and loops (for, while).

3. Structure of the Web - Matthew Heston and Jim Maddock

Many communications students study or use web based ICTs, yet the Internet largely remains a complex, unapproachable, “black boxed” technology. We hope to demystify “the web” for the non-technical communications audience, enabling students to build a rudimentary understanding of web based computing into their work or to explore these concepts further by developing more technical skills. This workshop will also allow students interested in pursuing a career in software project management or user experience to become more conversant with developers and designers.

4. Digital Exhaust - Jeremy Foote

We will talk about what sorts of online (and offline) activity can leave digital traces, what those digital traces look like, etc. We will talk about how this data is currently being used, both by businesses and by governments, as well as discussing potential valuable or dangerous uses of digital data. Finally, we will discuss the technological and legislative approaches to limit the collection and/or use of digital exhaust.

5. Algorithms are Everywhere - Scott Cambo and Mike DeVito

Algorithmic decision making systems are pervasive in business and culture, and have a general reputation as bias-free, even-handed decision makers. However, all algorithms have embedded biases, and these biases have real-world consequences. However, it is not impossible to identify and mitigate algorithmic bias. This workshop is an introduction to algorithmic bias, where it comes from, how to identify it, and how solutions to these problems will take cooperation and understanding between those charged with engineering the systems and those with the knowledge of culture, society, law, and ethics. Communication Studies students should be able to leave this workshop with enough general understanding of the concepts and jargon used with algorithms as well as their cultural and social impact to feel confident that they can successfully collaborate with software engineers to mitigate biases or even go on to learn how to engineer these systems themselves.

Workshop Assessments

Short workshop assessments in the form of anonymous canvas surveys will be completed at the end of each workshop by each student. Additional feedback outside of this format is also welcome.

Recordings and Privacy

It is essential to the success of this class that participants feel comfortable sharing questions, fears, reservations and various experiences during discussions. Therefore, you may not create any audio or video recordings during class time nor share verbatim comments with those not in

class whether through text messages, email, social media updates, casual lunch time conversation or any other format.

Getting Help or Answers to Questions

Course Details

Most of the information you need for this course will be on Canvas (syllabus, lecture slides, etc.).

If there's something course-specific you can't find on Canvas after looking carefully, email a fellow student (first) and one of the instructors (second) if your peers are also struggling to find it.

If you're having trouble with Canvas itself, you should contact NUIT Support: http://www.it.northwestern.edu/supportcenter/index.html

Attendance

As a workshop-based course, attendance every week is vital. Each workshop will build off of the previous workshops and missing a workshop may make it difficult to participate fully in the future. If you do need to miss a workshop, please let the instructors know as soon as possible.

Electronic and Other Distractions

To facilitate an environment in which we are all focused on discussion of relevant issues and learning, it is imperative that we all take steps to limit potential distraction. Except when clearly being used for purposes immediately related to class (and in a manner that is not distracting to others), laptops, tablets, cell phones, personal digital assistants, music players, cameras and other devices should all be turned off during class. You may not talk on the phone, text, IM, email, read, solve crosswords, take pictures, etc. during class. All of these activities are likely to distract you, your peers, and the instructors; which is not fair to others in the class. Those engaging in these activities may be called on by the instructor to describe what they are doing and/or asked to leave the class. Direct repercussions could include loss of class attendance and class participation points.

Students with Disabilities

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Office of Services for Students with Disabilities (SSD) as soon as possible (i.e., during the first week of classes, barring extenuating circumstances that prohibit this) to ensure that such accommodations are implemented in a timely fashion. In general and to ensure fairness to all students, the instructors will not make accommodations for disabilities

without documentation from the SSD office. For more information, visit the SSD website at http://www.northwestern.edu/disability.

Academic Integrity at Northwestern

Students are expected to comply with University regulations regarding academic integrity. If you are in doubt about what constitutes academic dishonesty, speak to the instructors before the assignment is due and/or examine the University web site. Academic dishonesty includes, but is not limited to cheating on an exam (e.g., copying others' answers, providing information to others, using a crib sheet) or plagiarism of a paper (e.g., taking material from readings without citation, copying another student's paper). Failure to maintain academic integrity on an assignment will result in a loss of credit for that assignment—at a minimum. Other penalties may also apply, including academic suspension. The guidelines for determining academic dishonesty and procedures followed in a suspected incident of academic dishonesty are detailed on the website.

For more information, visit:
http://www.communication.northwestern.edu/programs/undergraduate/policies_procedures/academic_integrity/

Sexual Harassment Policy

It is the policy of Northwestern University that no member of the Northwestern community—students, faculty, administrators, or staff—may sexually harass any other member of the community. Sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute harassment when:

- submission to such conduct is made or threatened to be made, either explicitly or implicitly, a term or condition of an individual's employment or education; or
- submission to or rejection of such conduct is used or threatened to be used as the basis for academic or employment decisions affecting that individual; or
- such conduct has the purpose or effect of substantially interfering with an individual's academic or professional performance or creating what a reasonable person would sense as an intimidating, hostile, or offensive employment, educational, or living environment.

For more information, visit: http://www.northwestern.edu/sexual-harassment/policy/index.html