# Course Syllabus

# Computing Everywhere

January 9 - February 7, 2018
Tuesdays, 7-9 pm, 560 Lincoln Residence Hall
Wednesdays, 7-9 pm, Willard Residential College B-72

**Student Point of Contact:** Jim Maddock, maddock (mailto:StephenMaddock2021@u.northwestern.edu) @u.northwestern.edu (mailto:StephenMaddock2021@u.northwestern.edu)

**Faculty Coordinator:** Jeremy Birnholtz, jeremyb@u.northwestern.edu (mailto:jeremyb@u.northwestern.edu)

## 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. Course Structure and Student Evaluation

# Course Structure and Student Evaluation

This course is not letter-graded and carries zero academic credits, but will appear on your transcript with a grade of ‘S’ (satisfactory) or ‘U’ (unsatisfactory). A grade of ‘Satisfactory’ will be earned by students who attend and participate in all 5 workshops.

## Instructors

**Elham Beheshti** (beheshti@northwestern.edu (mailto:beheshti@northwestern.edu) ) is a postdoctoral researcher in communication studies. She completed her PhD in Computer Science in 2017. Through the design and evaluation of innovative learning technologies, she studies how technology can enhance learning experiences that happen across multiple contexts, such as classrooms, homes, and museums.

**Scott Allen Cambo** (scottcambo2019@u.northwestern.edu (mailto:scottcambo2019@u.northwestern.edu) ) is PhD student in the Technology and Social Behavior program at Northwestern University studying how we can design computational systems that use AI or machine learning to be more interactive, transparent, and understandable.

**Mike DeVito** (devitom@u.northwestern.edu (mailto:devitom@u.northwestern.edu) ) is a doctoral student in the Media, Technology, and Society PhD program. His research focuses on user understanding of algorithmically-driven systems such as the algorithmic curation systems that power many social media platforms.

**Jamie Gorson** (jgorson@u.northwestern.edu (mailto:jgorson@u.northwestern.edu) ) is a is a 2nd year PhD Student in the Computer Science and Learning Sciences program (a new joint PhD between McCormick and SESP). She is advised by Nell

O'Rourke in the Delta Lab. Her research focuses on the design and creation of technology to enhance motivation in learning environments. She is currently designing and developing an IDE for novice programmers that promotes a growth mindset.

**Matthew Heston** (heston@u.northwestern.edu (mailto:heston@u.northwestern.edu) ) is a PhD student in the Technology and Social Behavior program. He has developed web applications to understand how people collaborate and communicate online.

**Jim Maddock** (maddock@u.northwestern.edu (mailto:maddock@u.northwestern.edu) ) is a second year PhD Student in the Computer Science and Communications departments at Northwestern University. He currently works with Darren Gergle and Aaron Shaw, studying collaboration and coordination dynamics across different language speaking peer-production and collective action communities.

**Clifton McFate** (c-mcfate@northwestern.edu (mailto:c-mcfate@northwestern.edu) ) is a PhD candidate in Computer Science. The goal of his research is to build robust intelligent agents that use language and reason about the world as fluently as we do. To that end his research has included topics such as natural language understanding, frame semantics, analogical reasoning, and qualitative modeling.

**Irina Rabkina** (irabkina@u.northwestern.edu (mailto:irabkina@u.northwestern.edu) ) is a PhD candidate in Computer Science. Her research is at the intersection of cognitive science and artificial intelligence; she is interested in building systems that not only behave like humans, but do so in a cognitively plausible way.

**Daniel Trielli** (danieltrielli2022@u.northwestern.edu (mailto:danieltrielli2022@u.northwestern.edu) ) is a PhD student at the Media, Technology and Society program at Northwestern University. He is researching how news reaches the public in our algorithmically-defined information space, and how computational journalism can be applied to investigate complex issues.

# Workshop Descriptions

1. Earsketch (1/9 & 1/10) – Jamie Gorson and Elham Beheshti

Want to learn how to code but find it boring? Does learning Python sound cool but intimidating? In this two hour workshop, you will learn the basics of python, all while creating music! We will use a program called EarSketch to teach computational ideas with the underlying motivation to create an awesome song!

2. The Structure of the Web (1/16 & 1/17) - Jim Maddock and Matthew Heston

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 theoretical understanding of web based computing into their work. We also teach students a basic web programming in order to both reinforce theoretical concepts and to provide a starting point if they wish to further develop their 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.

3. Cognition and Computation (4/11 & 4/12) – Clifton McFate and Irina Rabkina

AI virtual assistants like Alexa and Siri are becoming ubiquitous, but just how smart are these systems really? How do they both exceed and fall drastically short of the human assistants they emulate, and what would it even mean to call such a system intelligent? This workshop addresses these questions through the lens of two famous thought experiments, the Turing Test and Searle's Chinese Room, which represent competing schools of thought on AI. We will conclude by discussing how current AI virtual assistants fit into this decades old debate and where they may go in the future.

4. Algorithms Everywhere (1/30 & 1/31) - Mike DeVito and Scott Cambo

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. 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."

5. Data and Computational Journalism (2/6 & 2/7) - Daniel Trielli

As more data become publicly accessible and a wider variety of computational and analytical tools are easily available, data journalism and its most advanced branch, computational journalism, gain more and more prominence. News production institutions require more practitioners of it, generating a demand for better data-qualified journalists and journalism-aligned scientists. However, understanding data and computational journalism – its opportunities, concerns and limitations – it is useful not only for participants interested in working with it, but anyone drawn to data analysis, journalism, and even in a wider perspective, anyone who is keen on handling data and translating their findings to a wider audience. This workshop will be a combination of lectures, discussions, and exercises so participants can have a full overview of what is data and computational journalism.

# 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 to Jim or Jeremy 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 Jim (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 (http://www.it.northwestern.edu/supportcenter/index.html)**

# Attendance

As a workshop-based course, attendance every week is necessary to receive a grade of 'Satisfactory' for the course. Each workshop will build off of the previous workshops and missing a workshop may make it difficult to participate fully in the future.

# 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/accessiblenu/ (http://www.northwestern.edu/accessiblenu/)** .

# 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/ (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/university-policies/sexual-harassment-policy/index.html (http://www.northwestern.edu/sexual-harassment/university-policies/sexual-harassment-policy/index.html)**

# Course Summary:

| Date | Details |
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| Date | Details | |
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| Sun Jan 1, 2017 | Quiz Template (Do Not Publish) (https://canvas.northwestern.edu/courses/70710/assignments/399200) | due by 11:59pm |
| | Quiz Template (Do Not Publish) (https://canvas.northwestern.edu/courses/70710/assignments/399202) | due by 11:59pm |
| | Roll Call Attendance (https://canvas.northwestern.edu/courses/70710/assignments/399203) | |
| | Sorting Out Sorting Workshop Survey (https://canvas.northwestern.edu/courses/70710/assignments/399204) | |
| | Unnamed Quiz (https://canvas.northwestern.edu/courses/70710/assignments/399201) | |