Social Media, Ethics, and Automation

Introducing a free interactive online textbook

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ABSTRACT

Computer Science educators have made recent efforts to incorporate ethics into their introductory programming classes, as well as offer new programming classes that intersect with other fields (CS+X) to attract new and diverse groups of students. We contribute to these efforts with a free interactive online textbook which teaches intro programming in an interdisciplinary way: Social Media, Ethics, and Automation [1] (https://social-media-ethics-automation.github.io/book/). The interdisciplinary content of our textbook is primarily organized around social media topics, with interactive programming learning and activities (e.g., modifying bots) used to explore those social media topics. We call this way of organizing content X+CS since CS is used to support the other topic (social media), rather than vice-versa (traditional CS+X). Ethics are incorporated throughout, starting with a diverse set of ethical frameworks, and including ethical reflections with each activity. In this demo, we will explain our pedagogical goals and strategies and then show the features and interactivity of this online textbook.

CCS CONCEPTS

• Social and professional topics → Model curricula; CS1.

KEYWORDS

CS1, ethics, social media, introductory programming, bots, CS + X

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1 Background

1.1 Interactive Computing Textbooks

Computer Science educators have been experimenting with using interactive learning environments to increase student engagement, particularly with Jupyter Notebooks and Jupyter Books [2]–[4].

1.2 Ethics in Computing Courses

With increased scrutiny of ethics and justice in software [5]–[9], computer science educators have been increasing their focus on the role of ethics in computer science education [10]–[12], creating assignments [13], activities [14], and incorporating ethics in introductory programming classes [15].

1.3 Computing and other fields

Computer Science educators have also been exploring how to combine computer science curriculum with new fields outside of the more traditional fields of math, games, and data science (CS+X) [16], [17]. Educators have created introductory courses that integrate media [18] and cultural studies [19]. One goal of some educators in creating these combinations is to reach students who might normally not be interested in programming classes, particularly women [10].

2 Overview of Online Textbook

We combine intro programming with both social media topics, as well as ethical concerns into a free interactive online textbook [1]:

- url: https://social-media-ethics-automation.github.io/book/
  - short url: https://bit.ly/smeabook

The textbook includes: interactive coding demos, practice problems and (answers in the appendices), design activities, and guides for teachers including suggested homework assignments.

2.1 Programming Supports Social Media Topics

In combining introductory programming with the topics of social media and ethics, we wanted to incorporate these topics not additively but in a deeply integrated way. Of our three topics, we chose to organize our book around social media themes. This allows the learning and deployment of programming skills to function as a way of exploring these social media topics (by creating posting bots, scraping bots, recommendation bots, etc.). We felt it was important programming be a supporting topic rather than the main organizing theme to appeal to students more interested in social media than in programming (we call this X+CS instead of the more common CS+X, where the primary organization is around CS topics, with the X supporting the CS learning).

2.2 Interactivity

For the programming sections of each chapter, we provide Jupyter Notebook pages in our book for demos, practice problems, and assignments. This lets students load, run and experiment on these programming pages. We also created optional fake bot libraries so students can experiment with bot code without needing an account.

2.3 Integrating Ethics

To integrate ethical considerations throughout the textbook in an inclusive and non-prescriptive way, we introduce a diverse set of ethical frameworks as analytical tools (e.g., Confucianism, Aztec Virtue Ethics, Consequentialism, Ethics of Care, Ubuntu Ethics). Then in assignments and throughout the rest of the book we raise ethical considerations and ask students in discussions and assignments (including reflecting on the code they write) to practice and develop their skill in viewing situations through at least two ethical frameworks, comparing how each of those frameworks would parse the ethical dilemmas in the situation.

3 Demo

3.1 Expected Audience

Our expected audience is CS educators interested in combining computer science and other fields, incorporating ethics into programming classes. While we hope some are interested in using our new textbook, our larger goal is to inspire the creation of even more innovative, cross-disciplinary programming classes.

3.1 Other Presenters

Only the two authors will present.

3.2 Expertise of Presenters

Kyle Thayer is an Assistant Teaching Professor at the Information School at the University of Washington, where he teaches programming courses (including the one that is now this textbook). He also has a PhD and researched computer science education.

Susan Notess has a PhD in Philosophy from Durham University, where she researched listening and taught ethics at all undergraduate levels.

3.3 Materials Provided

We will provide participants with fliers that have links to the online textbook. We also will have bot accounts set up so we can share tokens and the audience can try running and modifying the code themselves on their own devices during the presentation.

3.4 Agenda for the Demo

0-5 min. Give out fliers, get audience started on loading demo page

5-15 min. Explain overall design of online textbook and course

15-30 min. Demo how to teach from the book, including audience trying to modifying a bot, and ethics discussions

25-30 min. Preview teachers guides

30-45 min. Questions from audience

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