

Incorporating Computational Sustainability into AI Education through a Freely-Available, Collectively-Composed Supplementary Lab Text

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We have initiated a laboratory textbook entitled “Artificial Intelligence for Computational Sustainability: A Lab Companion” that is designed to introduce undergraduate students of artificial intelligence (AI) to problems of environmental and societal sustainability. It is intended to accompany any primary AI textbook, but can also be used independently¹. The lab companion is structured as a set of self-contained chapters and sections that include explanatory and illustrative material concerning specific sustainability problems, accompanied by projects (of several weeks duration), assignments (of duration on the order of a week) and exercises (on the order of minutes to hours) at the intersection of AI and sustainability. The material is organized primarily based on AI topics; however, the lab companion also provides an alternate indexing based on sustainability topics.

The lab companion is implemented as a Wikibook, a sibling project of Wikipedia that enables crowd-sourced creation of academic textbooks. The lab companion is freely available at

http://en.wikibooks.org/wiki/Artificial_Intelligence_for_Computational_Sustainability:_A_Lab_Companion

A **Preface** for educators and learners outlines the motivations for the lab companion: not only for purposes of deep infusion of computational sustainability into the computing curriculum, but also to advance goals in communicating science to the public, integrating research and education, and other broader impact goals. An **Introduction** to Computational Sustainability overviews the nascent field, and AI’s special place in promoting the rational, informed, timely, and strategic thinking that long-term sustainable balances demand. The content chapters that follow describe AI problems with sustainability context.

Anyone can contribute to the “AI for Computational Sustainability” Wikibook; a **Guide for Contributors** provides basic style information and guidelines for contributing. To develop this resource, we need assistance from the Computational Sustainability and AI communities, and so strongly encourage interested readers to contribute material to the Wikibook. Interested readers are also encouraged to contact the authors with further questions and ideas.

¹ Although the lab companion may be used independently of an AI textbook, material in it will typically assume selected knowledge of AI at an undergraduate level.