Ngu (Nathan) Dang

Teaching Statement

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Overview

My teaching approach centers on the interactive storytelling approach and the "teach to learn" principle. Computer science is an abstract subject, so I frame topics as narratives: what problem are we solving, why does it matter, and what are the key ideas that make progress possible? I begin lectures and materials by connecting concepts to students goals and by making the underlying questions explicit. In parallel, my research practice of rewriting and simplifying dense literature reinforces my teaching: both aim to make complex ideas approachable without losing rigor. My goal is to create an environment where students can build their own meaning and confidence on a solid foundation in computer science and related areas.

1. Teaching Experience

I have experience in both classroom teaching and research mentoring. During six years as a PhD student at Boston University, I served as a teaching assistant for six courses spanning Discrete Mathematics, Linear Algebra, and Probability through Graduate Algorithms and Theory of Computation. I intentionally rotated through the undergraduate theory sequence so I could present a coherent flow, i.e. how discrete math, algorithms, and computation theory build a shared language for reasoning about computation.

I received excellent evaluations from instructors I worked with at BU, and student feedback consistently highlighted my clarity, responsiveness, and support: the majority (about 90%) of the responses answered "Strongly Agreed" that they would recommend me to other students as a TA. I also invested in improving my teaching by participating in TA training on evidence-based practices and by staying current through seminars and reading groups in theoretical computer science. Beyond discussion sections, I mentored undergraduate graders through weekly meetings and one-on-one calibration. I provided a starter rubric, then refined it with the group for each assignment to ensure feedback is consistent, fair, and learning-orientedespecially in large courses. Students frequently noted that our way of giving detailed, structured feedback improved their learning in their course evaluations.

2. Teaching Philosophy

My goal is for students to leave a course able to tell a coherent story with the concepts: to translate formal objects into useful mental models, and to move comfortably between intuition and rigor. To support this, I write detailed session notes that model how to organize ideas, connect new material to prior topics, and solve problems with a clear chain of reasoning.

In the classroom, I pair narrative framing with active participation. I regularly ask and encourage students to articulate "what the objects mean," test a definition on examples and counterexamples, and explain why a proof step is necessary. These small, structured moments, and guided problem

solving help students practice the habits that turn material into working knowledge. I strongly believe that appropriately narrating, organizing, and guiding the course materials allows the students to both easily find the tools on their own to solve homework/exam problems and leverage their own intuition for better understanding. In assessment, I prefer frequent low-stakes checks on the students e.g. quizzes, in-class problems paired with clear rubrics and targeted feedback. This helps students correct misunderstandings early and makes grading more transparent and equitable.

Furthermore, I am committed to inclusive teaching. BU's student body includes a wide range of background, preparation, and lived experience. Thus, I am aware of and sensitive to the needs of students who require accommodations for any disability, invisible or otherwise. To best accommodate this, I often remind students that they can reach me at office hours, over email, or at the end of my session to discuss any issues they are having with the course, and coordination with the Office of Disability Services when special accommodations are needed.

Finally, I pay careful attention to language. As a non-native English speaker, I understand how easily technical courses become inaccessible through unnecessary linguistic complexity. I aim for precise, simple English in my teaching, and I encourage consistent, student-friendly communication across the teaching team. Language barriers and ability status are two elementary factors that we must consider to make all students feel welcome.

3. Teaching Plans and Fits

I am best suited to teach core theory and algorithms courses, including Discrete Mathematics, Algorithms, and Theory of Computation. I like rotating through the curriculum so that courses reinforce one another rather than feeling isolated. For example, I treat introductory discrete math as "language training" in theoretical computer science: students learn how to state claims precisely, build proofs, and translate informal problems into formal objects. I then preview how those skills reappear in later courses, e.g. writing proofs of correctness in Algorithms Analysis and construct formal arguments on computational models in Theory of Computation.

In advanced courses, I aim to emphasize structured engagement with research and support students as they consider graduate school. I want to offer the kinds of scaffolding that made a difference for me: assisted reading of papers, approachable pre-scoped projects, and concrete workflow guidance. The defining shift from undergraduate to graduate education is proximity to the research frontier: undergraduates benefit from seeing how research works, while graduate students must be brought to the frontier itself and trained to contribute to it. I did not fully appreciate this distinction as an undergraduate, and I now aim to make it explicit for students navigating similar decisions. To this end, my focus for graduate courses is a "beginner" guide into research which includes close reading of selected papers, structured writing assignments (e.g., intensive problem solving, literature mini-surveys), and scaffolded projects with regular milestones. I aim to make the research frontier visible and then teach students how to approach it with good questions, locate assumptions, and identify tractable subproblems.

From the experience I gained at BU, I also believe I have the ability to teach adjacent subjects such as introductory machine learning and data science. I have been building competency through personal projects and coursework, but I want to achieve much more and view teaching as a way to deepen my mastery, especially where these areas connect to probability, linear algebra, and

algorithmic thinking. I am happy to begin contributing and gain some first-hand experience via co-teaching, leading discussion sections, or developing materials. Training myself this flexibility helps the department meet high student demand while maintaining quality instruction.