

The Primer - An Introduction to Physics, Mathematics, and Computer Science using Digital Storytelling

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April 26, 2018

The Primer is a digital tool encountered in the Hugo and Locus award winning novel *The Diamond Age* by Neil Stephenson. *The Diamond Age* is a work of speculative fiction in which extreme nano-technological progress has altered society, bringing about a Neo-Victorian era. Within the setting, the most powerful societies of the world have retreated into tribal structures. A tribeless orphan named Nell receives **The Primer**, a digital education tool designed to instruct literally any person from any tribe, or no tribe, in scientific and technological thinking.

“Nell,” the Constable continued, indicating through his tone of voice that the lesson was concluding ... “The difference between stupid and intelligent people - and this is true whether or not they are well educated - is that intelligent people can handle subtlety.”

What if we can create The Primer for real? With the help of Whittier College DigLibArts, we hope to use digital storytelling platforms like Scalar and machine learning techniques in python to create a workable version of The Primer that adaptively teaches students introductory topics in physics, mathematics, and computer science. Drawing on the artistic and engineering skills of Whittier College undergraduates, we hope to build a

project that is visually inviting and technically sound. Our main character is a robot avatar with whom the user can identify, and will guide the student through a story that teaches them science. The software will collect data on the progress of the student, and machine learning algorithms will then guide the avatar to better instruct the student. We hope to achieve a design loop such that The Primer provides an optimal learning experience tailored to the learner.

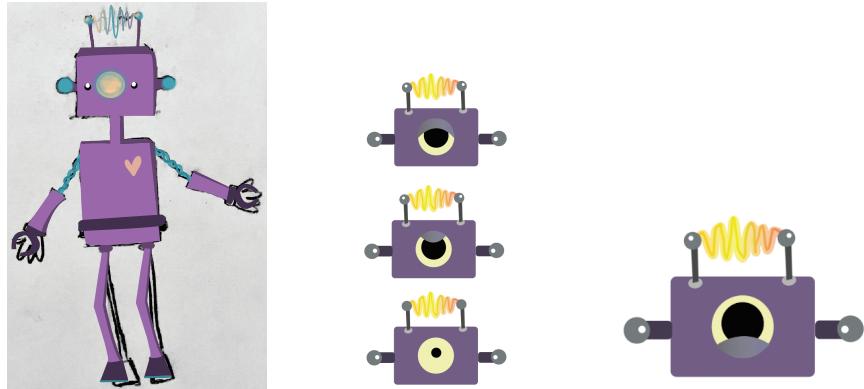


Figure 1: A robot avatar for The Primer main character.

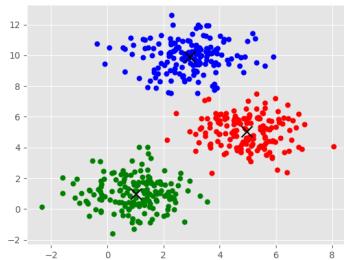


Figure 2: Clustering algorithms in python can be used to identify and classify patterns in student learning data.