Discrete Final Project: Annotated Bibliography

Lisa Hachmann, Mika Ichiki-Welches, Logan Sweet

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We used the textbook [6] as a jumping-off point for the project. It very simply described how Turing Machines can be solved, and provided practice questions. The example question in our presentation is taken from the exercises in the book. [8] was one of the most clear explanations of how to solve a Turing machine, and helped guide our exercise. Additionally, [3] broadened our idea of what states and symbols can look like in a Turing machine.

In [2] we read about the questions around effective computability that were being answered when Turing made his machine, and the answer in Church's Thesis. With [7], we read about Turing's original ideas of machines and computability. We read [11] to get a general background on Alan Turing and understand how his work fit into his context. We researched the halting problem in [10] to understand more of the question that Turing was pondering when he came up with Turing machines.

In [5], we read about more up-to-date research involving Turing machine theory, specific to small universal Turing machines. This paper used a lot of mathematics not covered in discrete, but the definitions were briefly explored and listed in the supplementary material.

[4] and [9] were very useful in understanding some non-traditional Turing machines. We used many photos from both these sources in the presentation as well. The image from [1] was used in the presentation as an illustration of "real-life" Turing Machines.

References

[1] Kong, Soonho. "Building a LEGO Turing Machine." *Soonho Kong Atom.* Carnegie Mellon School of Computer Science, n.d. Web. 04 Dec. 2016.

[2] Kozen, Dexter C. *Automata and Computability.* New York: Springer, 1997. Print. Lecture 28: Turing Machines and Effective Computability.

[3] MathWorld: Turing Machine, `http://mathworld.wolfram.com/TuringMachine.html`.

[4] Pegg, Ed Jr. "Turmite." From MathWorld–A Wolfram Web Resource, created by Eric W. Weisstein. `mathworld.wolfram.com/Turmite.html`

[5] Rogozhin, Turii. *Small universal Turing machines.* Theoretical Computer Science Journal, volume 168. 1996. `http://www.sciencedirect.com/science/article/pii/S0304397596000771`

[6] Rosen, Kenneth H. *Discrete Mathematics and Its Applications.* 5th edition. Boston: WCB/McGraw-Hill, 2002. Print.

[7] Turing, A.M. *On Computable Numbers, with an application to the Entscheidungsproblem.* November 1936. `https://www.cs.virginia.edu/ robins/Turing_Paper_1936.pdf`.

[8] University of Cambridge: "What is a Turing machine?". `https://www.cl.cam.ac.uk/projects/raspberrypi/tutorials/turing-machine/one.html`

[9] Weisstein, Eric W. "Langton's Ant." From MathWorld–A Wolfram Web Resource. `mathworld.wolfram.com/LangtonsAnt.html`

[10] Weisstein, Eric W. "Halting Problem." From MathWorld–A Wolfram Web Resource. `http://mathworld.wolfram.com/HaltingProblem.html`

[11] Wikipedia: "Alan Turing". `en.wikipedia.org/wiki/Alan_Turing`