

CSCI 334: Principles of Programming Languages

Lecture 15: Graphics

Instructor: Dan Barowy
Williams

Your to-dos

1. Read *Evaluation* **before Thursday**.
2. Lab 9 (project checkpoint #2), **due Wednesday, April 23** (group project).

Final project timeline

1. Brainstorm (Lab 7), **due Wed 4/9**
2. Project Proposal (Lab 9), **due Wed 4/23**
3. Minimally working version (Lab 10), **due Wed 4/30**
4. Final project + video presentation (Lab 11), **due Wed 5/14**

Student final projects in this class are routinely nominated for the **Ward Prize**.

Book your project meeting with me now:
<https://dbarowy.youcanbook.me/>

Announcements

- **Ellie Pavlick, Brown University**
- **Not-Your-Mother's-Connectionism: LLMs as Cognitive Models, Fri, Apr 18 @ 2:35pm in Wege Auditorium**

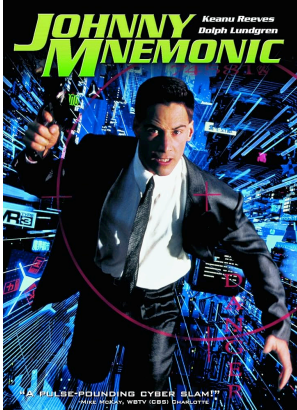


Recent advances in AI have led to large neural network models which exhibit human-like behavior across a range of language and reasoning tasks. This (re-)opens important theoretical questions about the nature of the structure that is required to support such behaviors, leading to debates reminiscent of long-running arguments that pit neural network models against explicitly structured symbolic models of the mind. In this talk, I will describe a series of experiments which highlight the ways in which LLMs today appear importantly different from the connectionist systems that inspired these debates originally. I will argue for a more nuanced stance which does not assume neural networks to be diametrically opposed to traditional models of the mind, but still acknowledges the potential of LLMs to teach us something fundamentally new about the structures that govern language and cognition in humans.

Ellie Pavlick is an Assistant Professor of Computer Science and Linguistics at Brown University, and a Research Scientist at Google Deepmind.

Announcements

- **Johnny Mnemonic, Thurs, Apr 24 @ 7pm in Wege Auditorium**



Benefits:

- Fun!
- Snacks!
- You will finally be able to understand your professor's jokes!
- You will be able to converse fluently with other nerds!
- You *might* learn a little computer science!
- Did I mention snacks?!!
- Sponsored by Jim Bern

Announcements

Please **consider being a TA** next semester (especially for this class!)

Applications **due Friday, April 18.**

<https://csci.williams.edu/tatutor-application/>

Announcements

Please **consider providing TA feedback**

Feedback **due Friday, April 18.**

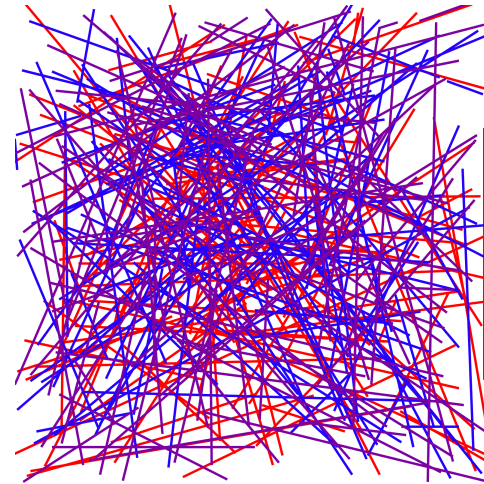
<https://forms.gle/sbqCGVLAFnhUQ4i39>

Topics

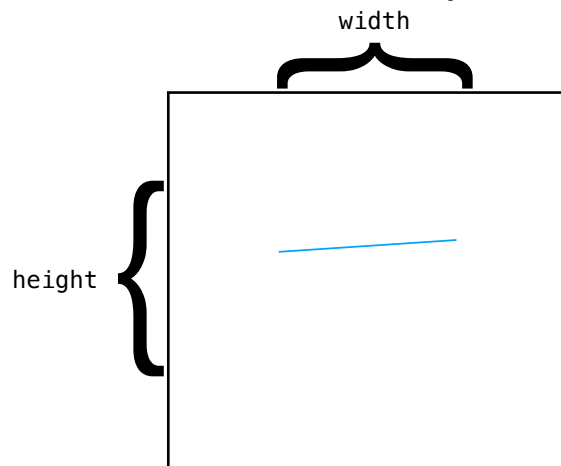
Drawing graphics

Compilers

```
repeat 100 red line
repeat 100 blue line
repeat 100 purple line
```

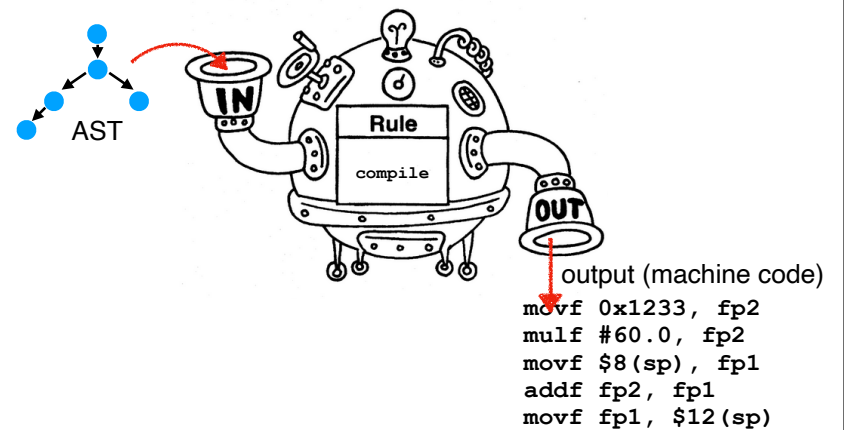


Scalable Vector Graphics (SVG)

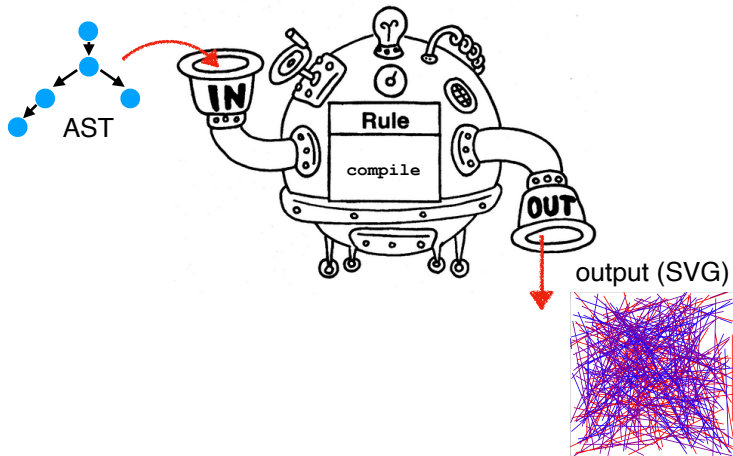


```
<svg width="400" height="400" [omitted] >
  <line x1="303" y1="137" x2="120" y2="149" style="stroke:rgb(0,0,255)" />
</svg>
```

Compilation



Compilation



Grammar

Start small!

```
<expr> ::= <line> <expr>
          | <empty>
<line>  ::= <color> line
<color> ::= red | green | blue | purple
```

(code)

Grammar

Grow your language

```
<expr> ::= <line> <expr>
          | repeat <n> <line> <expr>
          | <empty>
<line>  ::= <color> line
          <n> ::= <dig>+
          <dig> ::= 0 | 1 | 2 | ... | 9
          <color> ::= red | green | blue | purple
```


(code)

Recap & Next Class

Today:

Graphics
Compilers

Next class:

Type Inference