Language & Technology Wrapping Up

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Be Skeptical

- ► Humans overestimate technology. Loebner Prize/Turing test
- ▶ Don't buy the hype. deep learning, artificial intelligence, culturomics, neuroscientism, . . .
- ► Technological advances also come with downsides. unemployment, rising job requirements, mass surveillance, . . .

The State-of-the-Art in Language Technology

- Almost everything involves n-grams models.
 - word completion/prediction
 - stylistic analysis
 - ▶ OCR
 - spell checking
 - web search
 - word meaning
 - machine translation
- Frequency information from corpora/tree banks is used to add probabilities to the models.

Language is Complex

- Language comes easy to humans, but it is incredibly complex.
 - culture-specific rules of turn taking
 - hidden structure of sentences
 - how that hidden structure is inferred
 - building sentence meaning from word meaning
 - tons of variation across languages and dialects
- We have to deal with this complexity.
- Probabilities won't cut it because of Zipf's law.

Related Linguistics Courses

- ► LIN 101 Human Language
- ► LIN 110 Anatomy of English Words
- ► LIN 200 Language in the USA
- as background for sentence models:
 LIN 311 Syntax
 LIN 346 Language & Meaning
- as background for speech recognition: LIN 201 Phonetics LIN 301 Phonology

Planned Course for Fall 2018

- ▶ LIN 425 Computational Data Analysis
- computer-assisted statistics and data analysis
- useful for both computational and experimental linguistics

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My Computational Courses This Coming Spring

11 LIN 488 Internship

Help me adapt my Jupyter notebooks on mathematics in linguistics for an undergraduate audience.

2 LIN 630 Parsing & Processing

Computational parsing techniques and how they compare to human sentence processing.

Prerequisite: LIN 311 Syntax

Two Course Recommendations Outside Linguistics

- SOC 330 Media and Society (Jason J. Jones; no programming, but a bit of computational sociology and big data)
- 2 AMS 103 Applied Math in Technology (Matthew Reuter; includes a live cookie baking session)

Programming Concepts

Universal

- strings, integers, lists
- variables
- print, input
- conditionals
- while loops
- ► for loops
- custom functions
- regular expressions

Python-Specific

- counters
- positions and slices
- built-in functions like len, str.lower, ...

Sticking with Python

- You invested lots of time and energy on picking up some programming skills. They should not go to waste!
- ► The most important thing: find yourself a **project!**

Project suggestions

- Computational analysis in a book report
- Automatic menu generator for New York hipster restaurants
- Facebook bot to like all your friends' posts and leave a short reply
- Script to delete all unread emails that are older than 30 days
- Reminder to take a break after 2h in front of the screen
- Automating something you frequently do manually

Some Project Ideas from Reddit

Check out the Reddit thread:

Our department keeps a calendar of activities in excel. I use python to import that spreadsheet, break the activities into itemized tasks, put due dates on each task, and spit out those tasks for each teammate.

I stitched together a video encoding script, a mp3 tag reading script and a YouTube uploading script to automatically upload all of the old music I'd recorded to YouTube. Saved me 100s of hours of manual work.

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This is a pretty silly usage, but the autopy package is really great for making auto-clickers for various web-games.

I have a script that checks the Powerball and Megamillions jackpot size and calculates the expectation value of a play. If either is positive, it sends me a text to buy a ticket.

Not complete yet, but I am using python on a RasPi to automate the temperature, humidity, and lighting for my two pythons' cages

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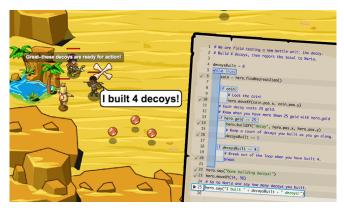
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My brother in law has a "habit" of going to jail. All. The. Time. My wife wants to know when it happens, so I setup a script to poll the local jail inmate rosters, and send me an email when his name shows up. It works pretty well.

Other Fun Stuff with Python

- Python coding for Minecraft http://www.instructables.com/id/Python-coding-for-Minecraft/
- Modding The Sims 4 http://simswiki.info/wiki.php?title=Tutorials:TS4_General_Modding
- Creating hi-res texture mods (e.g. for Resident Evil 4 HD) https://youtu.be/u_8l3vaVrfE
- Gray Hat Python book on hacking with Python

Code Combat & Code Wars



If you liked Code Combat, check out Code Wars!

How much Python Do I Know?

- ▶ We covered enough Python for 90% of all problems.
- But Python can do a lot more:
 - strides
 - dictionaries (of which Counters are a special case)
 - unpacking
 - zipping
 - recursive functions
 - object oriented programming with classes
 - generators
 - decorators
- And there's many powerful libraries:
 - pyplot
 - pandas
 - ▶ ntlk
 - scipy
 - scikit-learn
- Don't worry about any of this for now.

Additional Teaching Materials

If at some point you need to know more Python for your project, check out some of these:

- ► The remainder of our textbook

 Automate the Boring Stuff With Python
- The programming historian http://programminghistorian.org/
- Python programming for the humanities http://www.karsdorp.io/python-course/
- Natural language processing with Python http://www.nltk.org/book/
- Mark Summerfield's book Programming in Python 3
- ► For more theory, check out the book Language and Computers

Don't do it Alone!

- Form learning/reading groups with your classmates.
- Check out SBU undergraduate clubs and the events they host.
- Join online communities.
- Need advice? Send me an email or come to my office hours!

The Future

- ▶ We have launched an M.A. in Computational Linguistics.
- ▶ And we are developing a B.A., too.
- So expect more UG CompLing courses in the future!
- ► CompLing Info Session: Wednesday, December 13

Additional Announcements

I will post one or two items to Blackboard this month that might be of interest to you.