

# Build a Python Community of Practice at UH

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# Overview

- Brief intro
- Why Python@UH, objectives and target audience
  - Long preface towards a short answer
    - How you can contribute
    - Proposed meeting format
- Main Talk “**Python programming for real-world constraints – dark arts to envision execution and make systems run faster.**” Yannick Gingras
- Open discussion, reflections, announcements, etc.. : 15+ minutes

# Python In Academia

- Programming is a central tool in many disciplines
  - Researchers across disciplines are increasingly familiar with at least one programming or scripting languages
- Python is a popular introductory programming language.

The screenshot shows the ACM Communications website. At the top, the text 'COMMUNICATIONS OF THE ACM' is displayed. To the right is a search bar. Below this is a navigation menu with links: HOME, CURRENT ISSUE, NEWS, BLOGS (highlighted), OPINION, RESEARCH, PRACTICE, CAREERS, ARCHIVE, and VIDEOS. A breadcrumb trail below the menu reads: Home / Blogs / BLOG@CACM / Python Is Now the Most Popular Introductory Teaching... / Full Text. The main heading of the blog post is 'Python Is Now the Most Popular Introductory Teaching Language at Top U.S. Universities'. Below the heading, it says 'By Philip Guo' and 'July 7, 2014', with a link for 'Comments (12)'. In the bottom right corner, there is a blue button that says 'SIGN IN for Full Access'.

- Many other courses rely on Python
  - Data Science, machine learning, bioinformatics, econometrics, civil engineering, etc.

# Python In Academia - Cont'd

During the past decade, Python (an interpreted, high-level programming language) has arguably become the de facto standard for exploratory, interactive, and computation-driven scientific research. This issue discusses Python's advantages for scientific research and presents several of the core Python libraries and tools used in this domain. Although the issue's articles are self-contained, they nicely complement those in *CiSE*'s May/June 2007 special issue, "Python: Batteries Included."<sup>1</sup>

Published in: [Computing in Science & Engineering](#) ( Volume: 13 , Issue: 2, March-April 2011)

UDK 81'33

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TEACHING PROGRAMMING WITH PYTHON FOR LINGUISTICS STUDENTS:  
WHYS AND HOW-TOS

## ORIGINAL RESEARCH ARTICLE

Front. Neuroinform., 28 January 2009 | <https://doi.org/10.3389/neuro.11.001.2009>

## NEURON and Python

### Abstract:

The authors describe how they use Python for nanophotonics research-specifically, they describe using it for electromagnetic modeling, mask design, and process simulation

Published in: [Computing in Science & Engineering](#) ( Volume: 9 , Issue: 3, May-June 2007)

## Biopython: freely available Python tools for computational molecular biology and bioinformatics

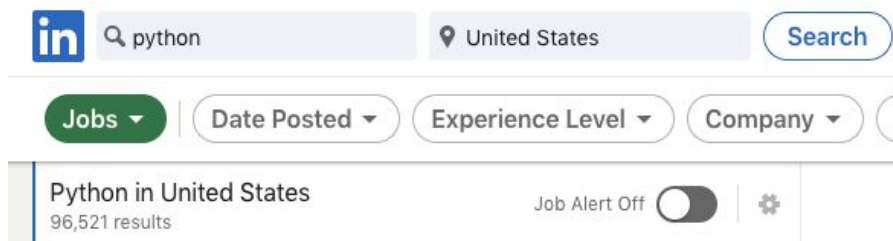
[Peter J. A. Cock](#) ✉, [Tiago Antao](#), [Jeffrey T. Chang](#), [Brad A. Chapman](#),  
[Cymon J. Cox](#), [Andrew Dalke](#), [Iddo Friedberg](#), [Thomas Hamelryck](#),  
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[Author Notes](#)

*Bioinformatics*, Volume 25, Issue 11, 1 June 2009, Pages 1422–1423,

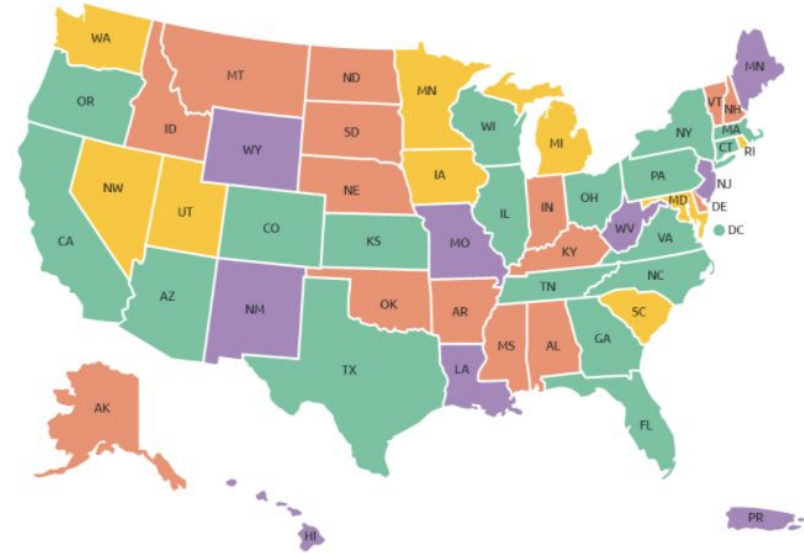
# Python in the Industry

- A top contender in many tasks, including web, data science, information security, network infrastructure, automation, scientific applications
- Dropbox, Spotify, Netflix, Facebook, Reddit, etc.
- Google engineering decision to use *“Python where we can, C++ where we must.”*



AVERAGE PYTHON DEVELOPER SALARIES 2020  
BY STATE

DAXX



◆ 110K+ ◆ 100-110K ◆ 90-100K ◆ 90K-

Source: daxx.com

Based on stats from indeed.com

# What Does Python Do Well for Me?

- Opinion as an instructor
  - A simple yet expressive syntax that is easy to learn
  - Introducing complex theory without getting bogged by the syntactic details
- Opinion as a practitioner
  - Provides access to a rich ecosystem of packages enhance productivity
  - Well supported language makes it very easy to find solutions to complex problems or bugs
- Opinion as a research principal investigator or project lead
  - Access to a greater pool of candidates
  - Easy to work with programmers at various levels
    - Different experience with Rust (lesser extent C and C++)

# Perl



- Most popular scripting language *circa* ~2000
- Used by large companies such Amazon, BBC, Craigslist, Yahoo, Zappos, eBay, DuckDuckGo, etc.
- Extremely expressive and flexible language
  - Tons of syntactic freedom
- Incredibly flexible and efficient for working with text
  - Very popular in bioinformatics

Perldoc Browser 5.32.0 ▾ Dev ▾ Documentation ▾

## NOTES

The Perl motto is "There's more than one way to do it." Divining how many more is left as an exercise to the reader.

# Perl Continued

- Did syntactic freedom contribute to its demise?

[Sep 29, 2020] At what point excessive syntactic flexibility stimulates perverted programming style which is reflected in the derogative term "complexity junkies"?

## Notable quotes:

*"... In your private role you are free to do whatever you wish. After all programming open source is about fun, not so much about discipline. ..."*

*"... The situation radically changes in commercial projects. If you are a manager of a large project you need to ensure a uniform and preferably simple style via guidelines that explicitly prohibit such "excesses" and to step on the throat of such "excessively creative" people to make them "behave". ..."*

*"... That's why languages that allow too much syntactic freedom are generally not welcomed in large commercial projects, even if they are able to manage large namespaces more or less OK. ..."*

[http://www.softpanorama.org/Scripting/Perlorama/perl\\_style.shtml](http://www.softpanorama.org/Scripting/Perlorama/perl_style.shtml)

02-13-14

## The Fall Of Perl, The Web's Most Promising Language

And the rise of Python. Does Perl have a future?



[IMAGE: FLICKR USER FADY HABIB]

<https://www.fastcompany.com/3026446>



# The Zen of Python

- PEP-20 (The Zen of Python) -- Informational
  - *“There should be one-- and preferably only one --obvious way to do it”*
- PEP 638 (Created: 24-Sep-2020) -- Standard Track for Syntactic Macros
  - *“Python is both expressive and easy to learn; it is widely recognized as the easiest-to-learn, widely used programming language. However, it is not the most flexible. That title belongs to lisp.”*
- Uncluttered, simple syntax that's easy to learn
  - Perl flexibility was in my experience a burden to learners.

# Python's Popularity

- Personal experience teaching workshops in Perl (2005-2008) and Python (2008 - today)
  - End of workshop message to Perl attendees: “Your confidence programming in Perl will start to grow as your program. It’s okay if you read a package’s documentation or code and you don’t get it. You will with time. Email me if you have any questions.”
  - Message to Python attendees after 2 days of instruction: “Remember to search whether there is a library that can do what you need to do. Typically, there is always one. So don’t start writing a code until you check that you cannot just reuse someone else’s code. Also, remember that Stack Overflow is your friend.”
- Other confounding factors may have contributed to students lack of confidence, but no doubt that language design decisions also contributed

# A Poisoned Chalice?

- Are Python's accessibility and simplicity barriers to growth as a python programmer?
- Plateaus versus perceived ceilings
  - Is it always clear that there could be better ways to do it?
- Frustration is part of skill development
  - Relatively hard to hit frustrations with Python?
- An incredible wealth of resources make it "relatively" easy to minimize frustration
- Expertise cannot be achieved without motivation
  - Where to find the inspiration when you do more with less



# Building a Python Community of Practice

- Community of Practice: group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.
- Widespread in academia and industry and take on different forms
- Academia: journal clubs, quantitative lunch meeting, UH ACM Student Club, Grey Hats etc.
- Industry: PyHawaii Meetup, WetWare Wednesdays, Sponsored luncheons, etc.

# Objectives

- Develop professional skills
  - Learn new tools, libraries, programming paradigms, etc.
- Transfer best practices
  - How to develop code that's interoperable, efficient, secure, maintainable, etc.
- Help solve problems quickly
  - What the heck, Python?!
  - <https://github.com/satwikkansal/wtfpython>

# Proposed Format and Target Audience

- Monthly event
  - 75- or 90-minute-long meeting
  - Short talk :
    - ~15 minutes with ~5 minutes for questions or comments
    - Project demos, opinions, new features, etc...
  - Main talk(s):
    - Single talk: ~30-40 minutes with 10-15 minutes for questions or comments
    - Two talks: 20 minutes talk with ~5-10 minutes for questions or comments
    - Discussion, reflections, announcements, etc.. : 15+ minutes
- Or
- Sync or async interaction through Discord

# How You Can Help

- Building a compendium of resources for Python enthusiasts
- Mentor someone by proposing a project on Python@UH Discord Channel
  - Join the channel if you haven't already done so
- Seek mentorship on proposed project or for you own projects
- Suggestions for speakers and topics
- Comments and recommendations on how to improving our meetings
  - Structure, format, content, etc.
- Target audience: Python enthusiasts
  - Most talk assume at least an advanced beginner level
    - Basic syntax skills and know what they are missing

**Questions, thoughts or comments?**



# About the Speaker

- Yannick Gingras
  - Founder and technical lead at **Ajah**
    - Data solutions and infrastructure for the nonprofit sector
  - Full-time rock climber
  - Fellow with the Python Software Foundation and Former PyCon co-Chair
  - Previously with Facebook
    - Production engineering manager -- cache consistency

