

# Cython

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# Hi!

- Stefan Behnel
- Software/Data Engineer & Trainer
- use Python since 2002
  - CPython core dev since 2019
- **Cython dev**
  - core dev since 2007
  - training and consulting (also in-house)
- work for **TrustYou** since 2017

# TrustYou

- Terabytes of hotel guest reviews
  - non-literate brain dumps, 24 languages, collected from all over the Internet, surveys, portals, partners, ...
- Text and data analysis
  - sentiment, categorisation, trends, tops/flops...
- Sell information
  - tell hotels what to improve
  - tell chains how their brands or branches compare
  - tell portals which hotels to recommend

# TrustYou Meta-Review

4.5 Excellent  
★★★★★

Summary of 45,806 verified reviews

All languages 100%
All 100%
Couples 63%
Families 30%
Solo 4%
Business 3%

Rated **4.5/5** based on reviews from **all travelers**.

"Excellent romantic hotel. Close to Las Vegas Strip. Good for sightseeing and located near shopping areas. Awesome vibe."

- EXCELLENT Overall Ranking**  
Top 4% in city
- EXCELLENT Romantic Hotel**  
Top 1% in city
- EXCELLENT Luxury Hotel**  
Top 2% in city
- EXCELLENT Hotel Grounds**  
Top 1% in city
- EXCELLENT Kids Facilities**  
Top 4% in city

Location  
4.5/5  
5517 reviews

**"Great location."**  
Central location with great sightseeing, dining out and shopping.  
Decent, but pricey, parking. Good accessibility by car.  
Near to public transport and the airport.

Pool  
4.3/5  
1339 reviews

**"Good pool, acceptably clean."**

Vibe  
4.3/5  
3563 reviews

**"Awesome vibe. Friendly atmosphere. Stylish hotel."**  
Hotel could use some updating. Pleasant entrance area. Luxurious Hotel.  
Nice for romantic trips. Luxury hotel. Good for traveling with friends.

Amenities  
4.2/5  
4328 reviews

**"Facilities are outdated, but outdoor sports facilities are top-notch."**  
Great buildings with nice entrance area and conference rooms.  
Nice grounds with great facilities for kids. Beautiful architecture.  
Smoking area is not nice. Handicap accessible facilities are all right.

Room  
3.7/5  
7298 reviews

**"Great room."**  
Great balconies and views, comfortable beds, and clean enough rooms.  
Inadequate minibars in older, poorly-maintained rooms.  
Bathrooms are large but with substandard cleaning.  
Substandard furniture, A/C, TV's and kitchenettes.  
Shower can be a problem.

- Good to know
- ✓ Pleasant hotel grounds
  - ✓ Friendly atmosphere
  - ✓ Great view
  - ✗ Reception should be more attentive

→ <https://trustyou.com>

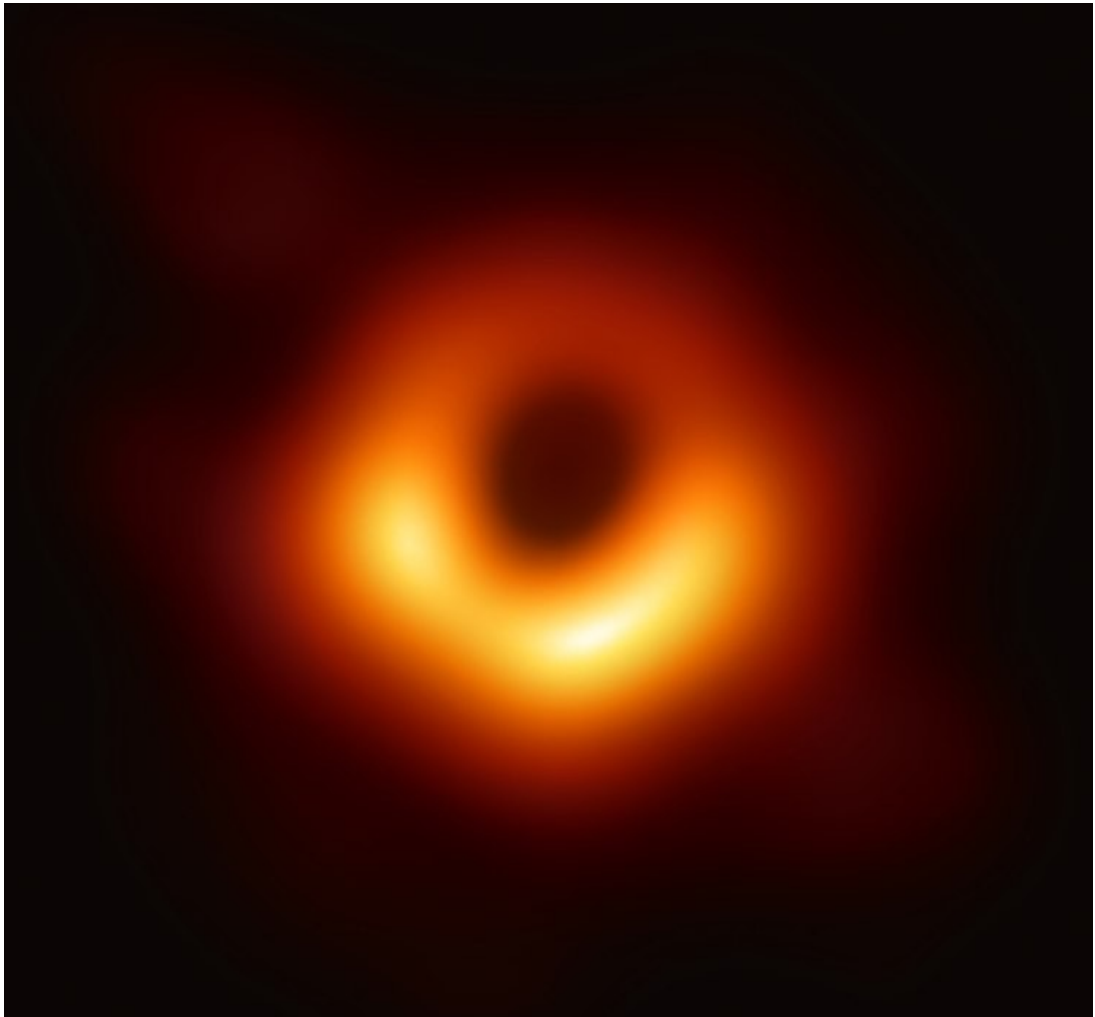
# Some Tools we use at TrustYou

- NumPy
- SciPy
- Scikit-learn
- Pandas
- nltk
- spaCy
- lxml
- PyYAML
- Hadoop/PySpark
- ...

# Some Tools we use at TrustYou

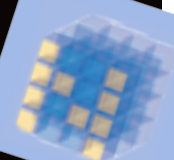
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- SciPy
- Scikit-learn
- Pandas
- ( nltk )
- spaCy
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- ...



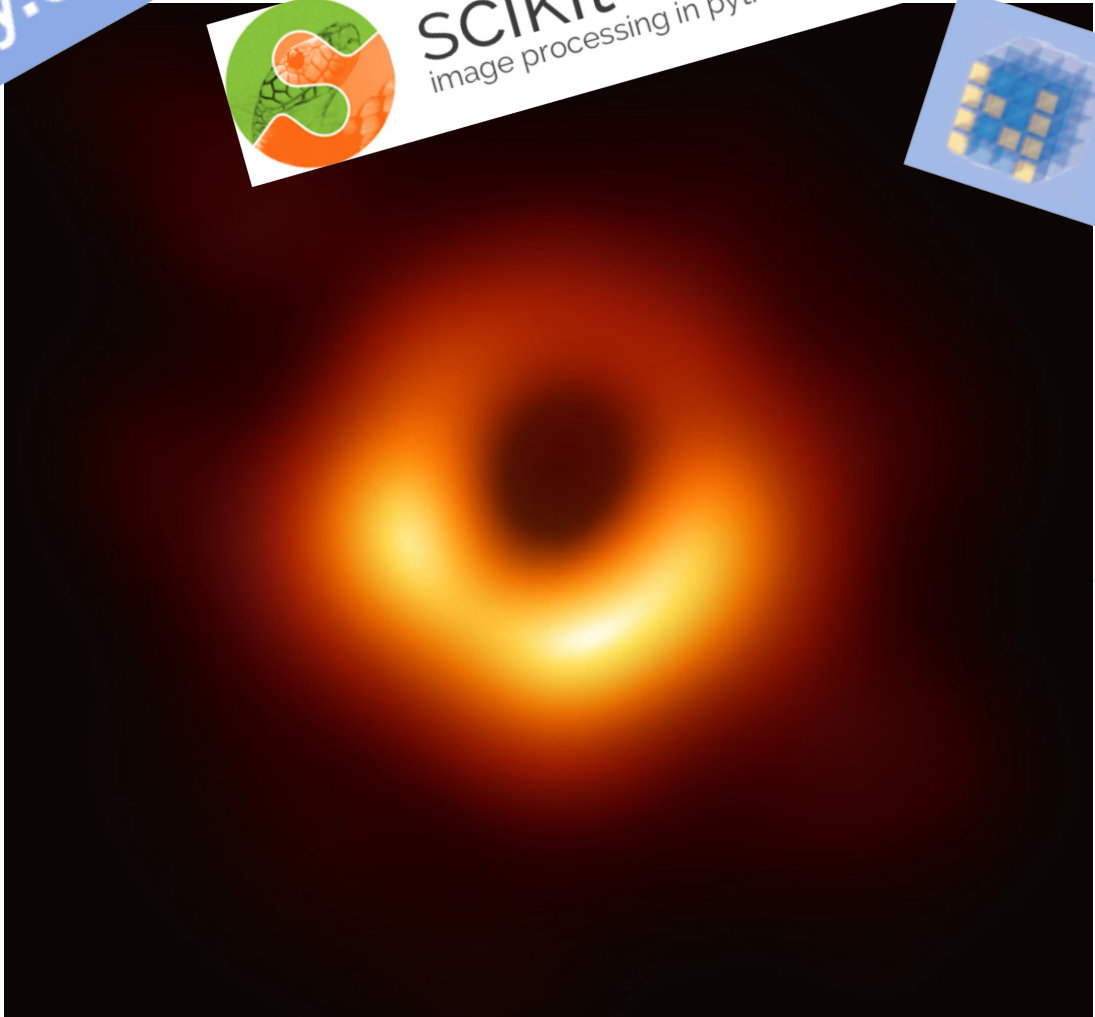


 SciPy.org

 scikit-image  
image processing in python

 NumPy

H5PY



pandas  
 $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$

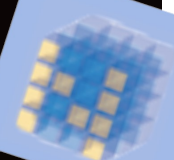
 The AstroPy Project

NetworkX



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NetworkX

# What is Cython used for?

- 1) Integrate native code with Python
- 2) Speed up Python code in CPython
- 3) Write C without having to write C

*“We write C so you don’t have to”*

# Gradual Typing in Python

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static typing == fast & cumbersome

dynamic typing == easy & slowish

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static typing == fast & cumbersome

↕ gradual typing ↕

dynamic typing == easy & slowish

# Gradual Typing

- Term coined 2006 by Siek & Taha
  - Blog post by Jeremy Siek (Univ. of Indiana/USA):  
<https://wphomes.soic.indiana.edu/jsiek/what-is-gradual-typing/>
  - Basis for Python's PEP-484 type annotations
- Best mix of static + dynamic typing
  - dynamic typing for ease of development
  - optional static typing for safety, speed, documentation
- Use static types only where they help
  - don't require them where they get in the way

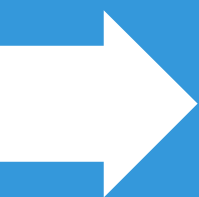
Don't type all your things!



# What is Cython?

- Pragmatic programming language
  - “Gradual Typing for Python”
- Optimising compiler
  - Production proven
  - Widely used
- All about «getting things done»
  - Keeps focus on functionality, not boilerplate
  - Allows moving freely between Python and C/C++
  - As pythonic as you want, as low-level as you need





# Demo

What's new in Cython 3.0 ?

**It's Python**

What's new in Cython 3.0 ?

**It's Python 3**

What's new in Cython 3.0 ?

**It's Python 3  
... by default**

# What's new in Cython 3.0 ?

- Python 3 by default
  - language level “3str”
- Python def-function compatibility
  - “binding” by default
- Binary special methods like Python (?)
- Positional-only arguments (PEP 570)
- Annotations as strings (PEP 563) (?)

<https://github.com/cython/cython/milestone/58>

Thanks!  
Any questions?

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more info: [www.trustyou.com](http://www.trustyou.com)