

Geographic Data Science

Introduction

Dani Arribas-Bel

This course

(Self-)Quiz

- Have you ever used data to make decisions in your life?
- Have you ever heard the term “Data Science”?
- Have you ever written a line of computer code?

Philosophy

- (Lots of) methods and techniques
 - General overview
 - Intuition
 - Very little math
 - Lots of ways to continue on your own
- Emphasis on the application and use
- Close connection to “real world” applications

Format

Eight blocks with:

- *Concepts*: videos + slides, readings
- *Hands-on*: concepts in (interactive) action
- *Do-It-Yourself*: practical material to do on your own

Content

- **Blocks A–C:** “big picture” content + computational tools (learning curve)
- **Blocks D–H:** “meat” of the course (lots of concepts packed)
- *Rest of the course:* prepare an awesome Computational Essay

Logistics – Website

https://darribas.org/gds_course



ENVS363/563

Geographic Data Science

Welcome to Geographic Data Science, a course taught by Dr. Dani Arribas-Bel in the Autumn of 2020 at the University of Liverpool.

Contact

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Note

A PDF version of this course is

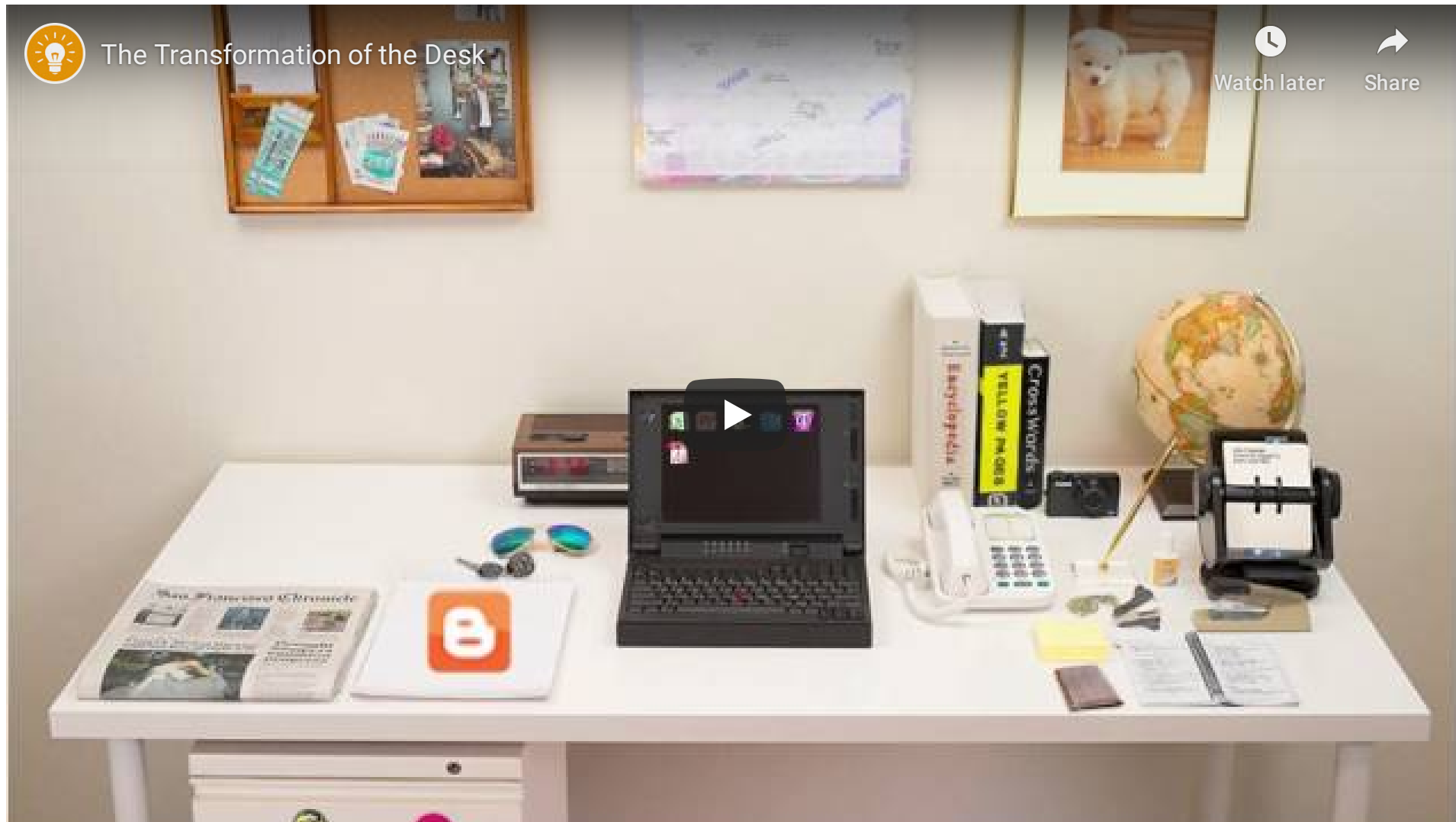
Logistics - Teams

The screenshot displays the Microsoft Teams web interface. The browser address bar shows the URL: https://teams.microsoft.com/_#/school/conversations/General?threadId=19:1283bdd4. The interface is divided into three main sections:

- Left Navigation Panel:** Contains icons for Activity, Chat, Teams (selected), Assignments, Calendar, and Help. The current team, "MSc GDS-201920", is selected, and the "General" channel is active.
- Header:** Displays "Microsoft Teams" and a search bar with the placeholder text "Search or type a command".
- Chat Area:** Shows the "General" channel for the "MSc GDS-201920" team. The chat history includes:
 - System messages: "Arribas-Bel, Daniel has added Phasey, Harry and Alotaibi, Sultan [olsalota] to the team." and "Arribas-Bel, Daniel has added Murage, Nombuyiselo to the team."
 - Message from **Murage, Nombuyiselo** (NM): "Hi Everyone" (sent Yesterday 9:49 PM).
 - Message from **Arribas-Bel, Daniel**: "Hello **Murage, Nombuyiselo**! I'm Dani, the programme director. In the coming days, I'll be adding everyone to this Team. For now, any questions you may have about the programme can drop them here." (sent 10:36 AM).
 - System messages: "Arribas-Bel, Daniel has added McCarthy, Leo to the team." and "Arribas-Bel, Daniel has added Harding, Edward to the team."

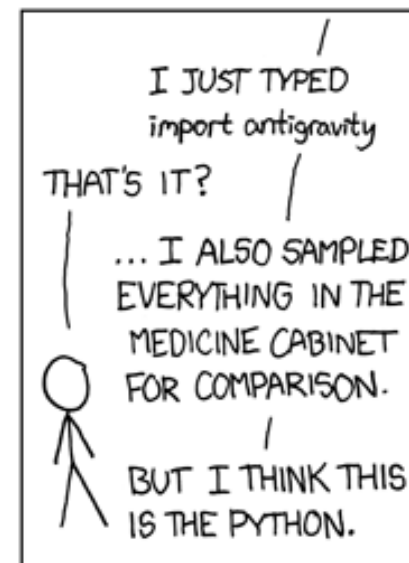
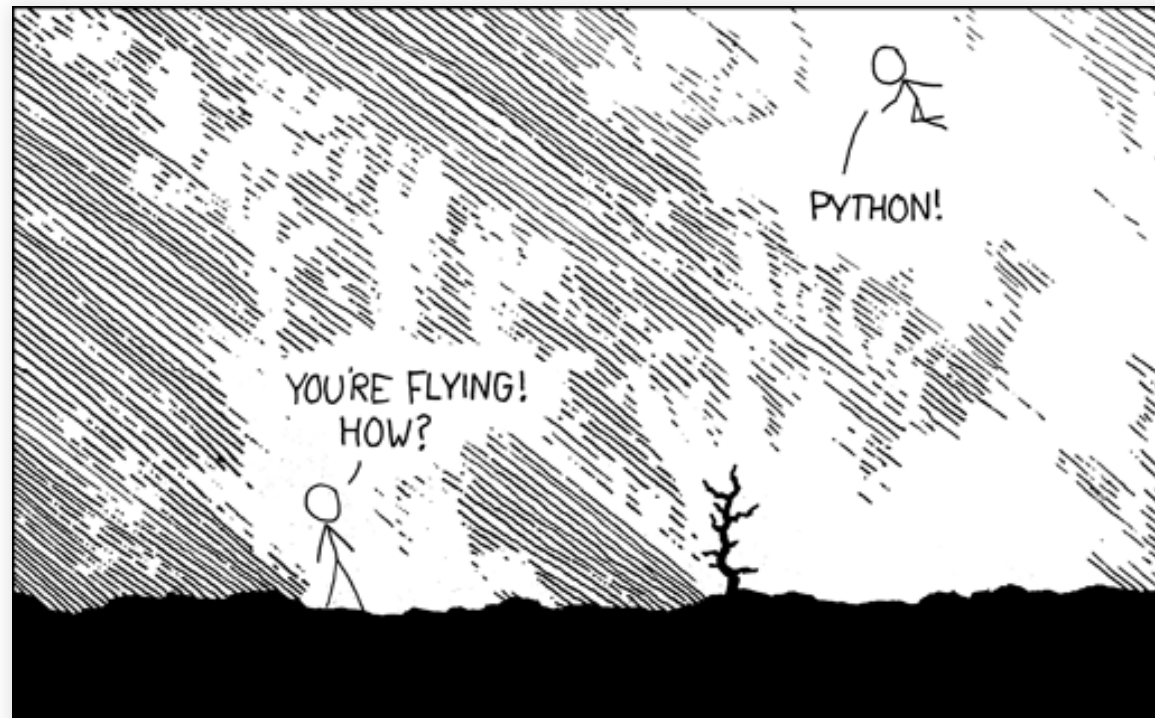
At the bottom, there is a text input field with the placeholder "Start a new conversation. Type @ to mention someone." and a toolbar with icons for text, attachments, emojis, GIFs, and video calls.

Code



Driving Vs automobile engineering

Python



Python

- **General purpose** programming language
- Sweet spot between “*proof-of-concept*” and “*production-ready*”
- Industry standard: **GIS** (Esri, QGIS) and **Data Science** (Google, Facebook, Amazon, Netflix, The New York Times, NASA...)

Self-directed learning

Prepare

- This is a **flipped class**: it's like a gym, the “subscription” does not make you fit
- **Bring** questions, comments, feedback, (informed) rants to Teams/labs
- **Teams, Teams, Teams**
- **Collaborate** (it's **NOT** a zero-sum win!!!)

More help!!!

This course is much more about “learning to learn” and problem solving rather than acquiring specific programming tricks or stats wizardry

- Learn to ask questions (but don't expect exact answers all the time!!!)
- Help others as much as you can (the best way to learn is to teach)
- Search heavily on Google + Stack Overflow

Workflow – Before a Lab

1. Go over the *Concepts* and *Hands-on* sections of a block
2. Get started on the *DIY*
3. Record questions and **post** them on Teams **prior to** the lab

Workflow – Online Labs

1. Come work on the *DIY* sections
2. Live answers to questions posted
3. Support from demonstrators and module lead

Assignments

Assignments

- **Computer tests**: W.5 (20%) and W.10 (25%)
- **Computational essay** (W.12, 50%)
 - Equivalent to 2,500 word
 - Report (*notebook*) with **code, figures** (e.g. maps), and **text**
- **Discussion board** (5%)

NOTE: recommendation letters only for great students (>70)



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