Geo-application Development

Introduction

Course Details, Motivation, Admin, Grading

Dirk Tiede, Bernd Resch

Offer: Winter Term 21/22

- By definition (curriculum): no more than 16 students

- **Course will also be offered in the coming term**

➔ Those who do not absolutely require the course for their course of study, please think about taking the course in the coming term.

Organisational ::: Dates

- Mondays, 12.30-14.45
  https://uni-salzburg.webex.com/uni-salzburg/j.php?MTID=m7e4a08d7d7e0f95c0e58cf87aeeb761d

    - First part (Bernd Resch): until 03 May
      Second part (Dirk Tiede): from 10 May

- Course available on Blackboard and PLUS Online

- Entire course (both parts): 6 ECTS, ~150 hours workload, 1 grade

- *16 July 2021   Final Project Due Date*

Organisational ::: Pathway Forward

- **Teaching modalities**

  - Online teaching for now

    - Most probably for the entire semester

    - Online presence required

Organisational ::: Pathway Forward

- Any questions?

https://cdn.nohat.cc

designed by freepik

Organisational ::: Grading Scheme

- For **you**:

  - Interim Assignments – 30%

  - Final project – 50% (programming project)

  - Active participation in class – 20%

- For **us**:

  - Evaluation!

Motivation

- "Why Programming Is the Core Skill of the 21st Century"

http://readwrite.com/2013/05/31/programming-core-skill-21st-century

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Motivation

- "7 million job openings in 2015 in occupations that required coding skills"

- "Programming jobs overall are growing 12% faster than the market average."

https://www.fastcompany.com/3060883/the-future-of-work/why-coding-is-the-job-skill-of-the-future-for-everyone

3 MINUTE READ | THE FUTURE OF WORK

Why Coding Is Still The Most Important Job Skill Of The Future

Computer programming jobs may be declining, but coding is becoming the most in-demand skill across industries.
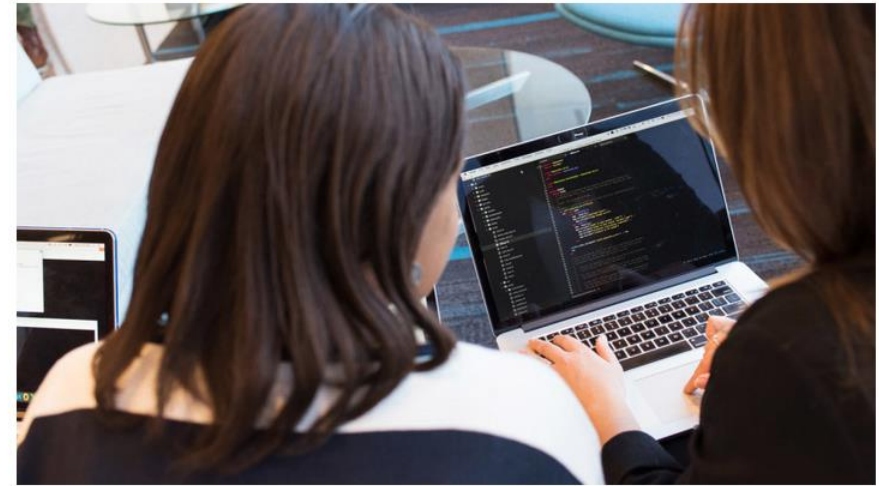
[PHOTO: FLICKR USER WOCINTECH CHAT]

BY LYDIA DISHMAN   06.14.16 | 5:02 AM

Apart from companies in the technology sector, there are an increasing number of businesses relying on computer code. No

Motivation

WEDNESDAY, JANUARY 25, 2017

The Bright Side Of The Labor Market: Coding (No Pocket Protector Required)

CAREER MILLENNIALS | BY: SARAH M

At first glance, the labor market looks dour for many Millennials and Generation Z. In a 2015 report by McKinsey, the International Labour Organization estimates that 73.4 million people aged 15-24 are jobless. At the same time there seem to be job vacancies, particularly in tech:

- Eight out of the 25 top jobs in America are tech positions (Glassdoor, 2016).
- According to Burning glass, a labor market analytics firm, 7 million job openings in 2015 required coding skills. They also found that **programming jobs are growing 12% faster** than the market average.
- Salary wise, jobs requiring coding skills **pay up to $22,000 per year more than non-tech jobs** (Burning Glass).
- Finally, coding reaps work-life balance benefits. According to a 2015 report by Glassdoor, six of the 10 top jobs offering greater work-life balance are in tech.

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Motivation

- "Why Geographers Should Learn to Code"

By Alex Singleton:
January 2014 issue of Geographical Magazine - page 77

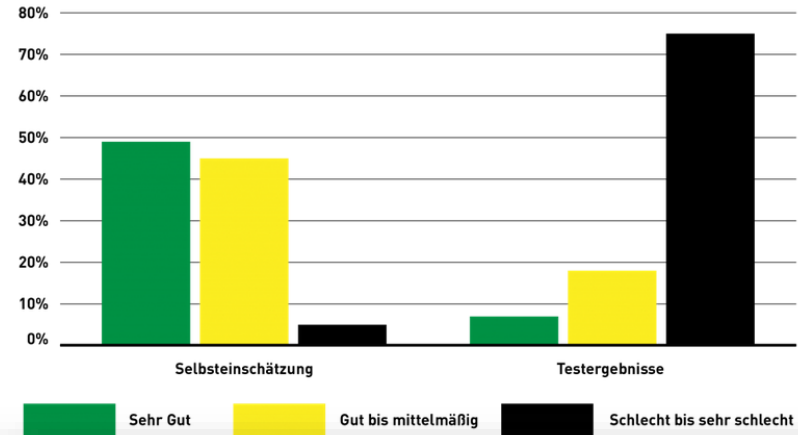http://blogs.casa.ucl.ac.uk/2014/01/04/why-geographers-should-learn-to-code

Motivation

- Programming as a separate subject in school

➜ Digital literacy

➜ Self-determined life

https://kontrast-blog.at/facebook-und-google-auf-den-stundenplan

Computer-Grundkenntnisse der Österreicher

Legend: Sehr Gut (green), Gut bis mittelmäßig (yellow), Schlecht bis sehr schlecht (black)

Categories: Selbsteinschätzung, Testergebnisse

PROGRAMMIEREN ALS SCHULFACH

Wer ein Gerät bedienen oder ein Programm anwenden kann, hat die Funktionsweise noch lange nicht durchschaut. Ohne ein tiefgreifendes Verständnis der Hard- und Software bleiben die enormen Potentiale der Digitalisierung ungenützt. Wer das Gerät nur anwenden kann, ist den vorhandenen Programmen ausgeliefert und wird zum „Sklaven der Computerindustrie". Er kann nicht den eigenen Bedürfnissen entsprechend eingreifen, sondern muss sich den vorgegebenen Abläufen unterwerfen.

Es steht außer Streit: Informatik ist eine der Grundlagenwissenschaften des 21. Jahrhunderts. Es gibt kaum mehr Bereiche in unserem Leben, die nicht mit Computern in Verbindung stehen. Trotzdem leisten wir es uns, das Fach zu vernachlässigen und qualitätsvolle Ausbildungen auf einige spezialisierte Schulen zu beschränken. Angesichts der Rolle, die Computer bereits in unserem Leben spielen – und erst recht in 20 Jahren spielen werden – ist das zu wenig.

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Didactical Concept

- Instructed learning → theory, basic syntax and code structures

- Self-guided learning → problem-solving

- Collaborative learning → more complex tasks

➜ Discussion amongst students, "peer-tutoring"

➜ Fundamentum/addendum

http://www.informationweek.com

Overview ::: Goals and Contents

- Development of (mobile) web apps using **geo-browser APIs**

  - ◆ Introduction to web development (HTML, CSS, JavaScript, AJAX)

  - ◆ Practical use of geo-browser APIs

  - ◆ Basics of responsive web design methods

  - ◆ Service-based data access

Overview ::: What you will learn: to …

- Development of mobile web apps using **geo-browser APIs**

  - …understand the coding concepts of **JavaScript**

  - …design and implement a **(mobile) web app**

  - …understand the usage of **web-based map libraries**

  - …apply basic **responsive design** guidelines

Overview ::: Goals and Contents

- Development of Geo-processing applications using **Python and ArcGIS**

  - Introduction to Python (open-source scripting language)

  - Introduction to the geo-processing framework in ArcGIS

  - Introduction to ArcPy - the ArcGIS interface for Python

  - Script-Tool development

  - Batch-processing geo-processing scripts
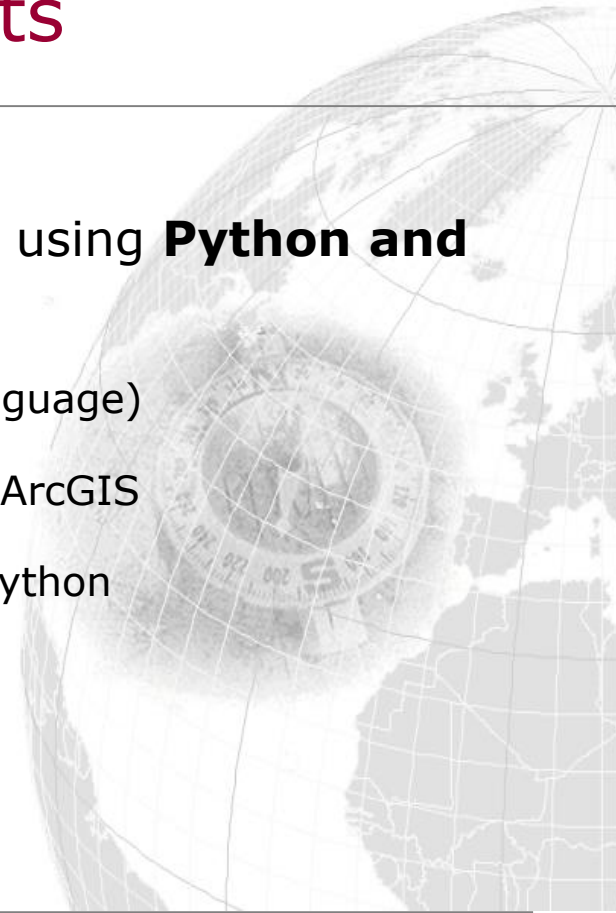
Overview ::: What you will learn: to ...

- **Development of Geo-processing applications using Python and ArcGIS**

  - ◆ ...read and understand **Python** code

  - ◆ ...understand the **geo-processing interface** in ArcGIS

  - ◆ ...write small programs in Python and modify Scripts to produce **batch files**

  - ◆ ...develop and integrate **Script-Tools in ArcGIS**

End of Term Assignment (Final Project)

- …requirements and procedure will be presented separately later in the semester

  → **You will define your own topic!**

  → **Feel free to discuss with us at any time!**

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