#1 Introduction +

Where is the digital revolution?
Back to normal? How was it, though?

Let me know when you have some special needs
Outline

1. digital revolution or hype?
2. about us
3. goals of this course
AI: A non-standard Introduction
The world has changed, hasn’t it?

A symbolic image of artificial intelligence (HWZ)
An Era of Big Data + AI
Group Discussion
What makes a computer looking intelligent?

AI is a moving target with respect to ...

- human capabilities
- technological abilities
Transfer of Human Intelligence
from static machines to more flexible devices

- mimicking intelligent behavior
  reading + seeing + hearing
  speaking + writing + drawing
- a sense of contextual perception
- many degrees of freedom
Seeing like a Human?

An image segmentation with Facebook’s Detectron2 (Wu et al. 2019)
Speaking like a Human?

Meena Conversation 4

<table>
<thead>
<tr>
<th>Human:</th>
<th>Meena:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hi!</td>
<td>Hey! How’s it going?</td>
</tr>
<tr>
<td>How’s what going?</td>
<td>Pretty good. How’s your day been?</td>
</tr>
<tr>
<td>Excellent. I spent most of trying to learn to surf.</td>
<td>Sweet! What kind of surfing?</td>
</tr>
<tr>
<td>The kind where I try to catch a wave and fail</td>
<td>Haha. Do you have a surfboard?</td>
</tr>
<tr>
<td>I borrowed a friend’s, to see if I like it. I’m still a beginner.</td>
<td>Ah. I’m sure you’ll get the hang of it.</td>
</tr>
<tr>
<td>Appreciate the vote of confidence :) Have you ever been surfing?</td>
<td>I have! It’s actually a ton of fun.</td>
</tr>
<tr>
<td>Did you find it hard at first?</td>
<td>A little bit, yes. But once I got the hang of it, it was really fun.</td>
</tr>
<tr>
<td>That’s good to know. Do you go surfing regularly?</td>
<td>Yup. I live in southern Arizona, so there’s plenty of surfing to be had.</td>
</tr>
</tbody>
</table>

Chatting with Google’s Meena (Adiwardana et al. 2020)

Not really, Arizona is not by the sea.
Beyond Perception and Unimodality
Generated Images by a Neural Network

https://thisxdoesnotexist.com/

Give me more!
Trend towards Multimodality

Breakthrough by combining language processing and image generation with GLIDE (Nichol et al. 2021)
Deepfakes? It is real!

“a man with red hair”

“a girl hugging a corgi on a pedestal”
Demos of *intelligent* Text Processing

Can you disenchant them?

- sentiment analysis
- question answering
- creating images from text
- text generation
- chat bot
- machine translation
- zero-shot classification
- image captioning
Artificial Intelligence

Subfields

- Natural Language Processing (NLP)
- Computer Vision (CV)
- Robotics
How does Computer Intelligence work?

- interchangeably (?) used concepts
  Artificial Intelligence (AI), Machine Learning (ML), **Deep Learning** (DL)

- generalize **patterns** from lots of data
  more recycling than genuine intelligence theory agnostically

- supervised **training** is the most popular
  pairs of input data and outcome
AI Hype in a Nutshell

$\text{AI} = \text{from humankind import solution}$
This is how current AI looks like
Why this matters for Social Science
Computational Social Science

data-driven research

- computational social science (Lazer et al. 2009)
  Digital Humanities, Computational History, Data Science
- highly interdisciplinary
- early computational history already in 1960s (Graham, Milligan, and Weingart 2015)
Group Discussion

What kind of data is there?

What data is relevant for social science?

- data as traces of social behaviour
  - tabular, text, image

- datafication
  - sensors of smartphone, digital communication

- much of human knowledge compiled as text
About the Mystery of Coding

coding is like...

- cooking with recipes
- superpowers
Women have coding powers too!
Where the actual Revolution is

Coding is a superpower ...

- flexible
- reusable
- reproducible
- inspectable
- collaborative

... to tackle complex problems on scale
About us
Personal Example

directed country mentions in UN speeches
Goals of this Course
What you learn

- **computationally analyze**, interpret, and visualize **texts**
  command line + Python

- **digital literacy** + scholarship

- **problem-solving** capacity
Learnings from previous Courses

- too much content, too little practice
- programming can be overwhelming
- learning by doing, doing by googling
Levels of Proficiency

1. awareness of today’s computational potential
2. analyzing existing datasets
3. creating + analyzing new datasets
4. applying advanced machine learning
What I teach

- computational practices
- critical perspective on technology
- lecture-style introductions
- hands-on coding sessions
- discussions + experiments in groups
Topics

Techniques

- text processing
- extracting and aggregating information
- creating simple visualizations
- optical character recognition (OCR)
- scraping files

Data

- using existing resources
- creating new resources

 输入s are more than welcome!
## Provisional Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 March 2022</td>
<td>Introduction + Where is the digital revolution?</td>
</tr>
<tr>
<td>10 March 2022</td>
<td>Text as Data</td>
</tr>
<tr>
<td>17 March 2022</td>
<td>Setting up your Development Environment</td>
</tr>
<tr>
<td>24 March 2022</td>
<td>Introduction to the Command-line</td>
</tr>
<tr>
<td>31 March 2022</td>
<td>Basic NLP with Command-line</td>
</tr>
<tr>
<td>07 April 2022</td>
<td>Learning Regular Expressions</td>
</tr>
<tr>
<td>14 April 2022</td>
<td>Working with (your own) Data</td>
</tr>
<tr>
<td>21 April 2022</td>
<td>no lecture (Osterpause)</td>
</tr>
<tr>
<td>28 April 2022</td>
<td>Ethics and the Evolution of NLP</td>
</tr>
<tr>
<td>05 May 2022</td>
<td>Introduction to Python</td>
</tr>
<tr>
<td>12 May 2022</td>
<td>NLP with Python</td>
</tr>
<tr>
<td>19 May 2022</td>
<td>NLP with Python + Working Session</td>
</tr>
<tr>
<td>26 May 2022</td>
<td>no lecture (Christi Himmelfahrt)</td>
</tr>
<tr>
<td>02 June 2022</td>
<td>Mini-Project Presentations + Discussion</td>
</tr>
</tbody>
</table>
You will be tech-savvy...

...yet no programmer applying fancy machine learning
Requirements

- no technical skills required ✓
  self-contained course

- laptop (macOS, Win10, Linux) 📱
  update system
  free up at least 15GB storage
  backup files
Grading

- 3 exercises during semester
  no grades (pass/fail)

- mini-project with presentation
  backup claims with numbers
  work in teams
  data of your interest

- optional: writing a seminar paper
  in cooperation with Prof. Sophie Mützel
Organization

- seminar on Thursday from 2.15pm - 4.00pm
- course website KED2022 with slides + information
- readings on OLAT

communication on OLAT Forum
  - forum for everything except personal
  - subscribe to notifications
  - direct: alex.flueckiger@doz.unilu.ch
Who are you?

Please fill out this questionnaire
Questions?
Reading

Required
(via OLAT)

Optional

online
References


