## Week 1: Data Engineering
## Lecturer: Dr. Jonathan Fürst
Campus ZHAW School of Engineering, Winterthur, Switzerland

| | Saturday June 29th | Sunday June 30th | Monday July 1st | Tuesday July 2nd | Wednesday July 3rd | Thursday July 4th | Friday July 5th | Saturday July 6th | Sunday July 7th |
|---|---|---|---|---|---|---|---|---|---|
| 7:30 am - 9 am | | | Breakfast US-guests | Breakfast US-guests | Breakfast US-guests | Breakfast US-guests | Breakfast US-guests | **Weekend Excursion to Rhine Fall & Alpstein Mountain Range**<br><br>**Rhine Fall**: Boat trip Rhine Fall & Laufen Castle<br><br>Transfer by coach to Alpstein<br><br>**Alpstein Mountain Range:** Guided Tour "Wildkirchli / Äscher" (tbc)<br><br>Overnight stay at Berggasthaus Ebenalp | Breakfast at Berggasthaus Ebenalp and Check-out |
| 9 am - 12 pm | Arrival of US-guests | | **Lecture:**<br>- The Data Science-Process<br>- Elements of Exploratory Data Analysis<br><br>**Lab:**<br>- Development Environment<br>- The Python Data Science stack | **Lecture: Data Curation**<br>- Data Integration<br>- Data Extraction<br>- Data Wrangling and Exploration<br>- Record Linkage<br><br>**Lab:**<br>- Data Extraction, Data Wrangling and Exploration | **Lecture: Pre-processing and Feature Extraction**<br>Unstructured Data<br>- Text<br>- Images<br><br>**Lab:** tbd | **Lecture: Data Annotation and Scaling**<br>- Data Centric AI<br>- Big Data<br><br>**Lab:**<br>Data Annotation<br>Parallel data processing with Dask | **Topical excursion to a company (tbd)** | | Short hike (tbc)<br><br>Coach transfer to Winterthur |
| 12 pm | | | Lunch Mensa | Lunch Mensa | Lunch Mensa | Lunch Mensa | Lunch at the company or lunch packages | | no lunch organized |
| 1 - 5 pm | | **Welcome Barbecue or another fun group activity** | **Data Science Project**<br>Introduction and Selection of Project(s)<br>Project Work<br>- Project Charta<br>- Data Management<br>- Exploratory Data Analysis | **Data Science Project**<br>Project Work<br>- Data Management<br>- Data Report | **Data Science Project**<br>- Project work in groups and individual supervision | **Data Science Project**<br>- Project work in groups and individual supervision<br>Project checkpoint presentations and discussions. | 4 pm: Frack Parade and night of technology at ZHAW SoE | | Free time |
| 6pm | | | Dinner for US guests, restaurant | Dinner for US guests, restaurant | Dinner for US guests, restaurant | Dinner for US guests, restaurant | Dinner at night of technology | Dinner at Berggasthaus Ebenalp | No organized dinner |
| Night | US-guests | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Berggasthaus Ebenalp | Hostel Depot195 |

## Week 2: Machine Learning
## Lecturers: Dr. Manuel Dömer and Dr. Andreas Weiler
## Campus ZHAW School of Engineering, Winterthur, Switzerland

| Date<br>Time | Monday<br>July 8th | Tuesday<br>July 9th | Wednesday<br>July 10th | Thursday<br>July 11th | Friday<br>July 12th | Saturday<br>July 13th | Sunday<br>July 14th |
|---|---|---|---|---|---|---|---|
| 7:30 - 9 am | Breakfast for US-guests | Breakfast for US-guests | Breakfast for US-guests | Breakfast for US-guests | Breakfast for US-guests | US-guests: Check-out Hostel Depot 195, no breakfast organized<br><br>**Transfer to Allendale (MI), USA** | **Transfer to Allendale (MI), USA** |
| 9 am - 12 pm | **Lecture:**<br>Supervised Learning:<br>- Regression<br>- Classification<br>- Evaluation<br><br>**Lab:** Supervised Learning using the Python Stack | **Lecture:**<br>Unsupervised Learning<br>- Clustering<br>- Anomaly Detection<br>- Evaluation<br><br>**Lab:**<br>Unsupervised Learning using the Python Stack | **Lecture:**<br>- association rules-recommender systems<br><br>**Lab:**<br>- Recommender Systems using the Python Stack | **Data Science Project**<br>- Project work in groups and individual supervision | **Excursion Berne**<br><br>Coach transfer to Bern<br><br>Guided tour of the Parliament Building (tbc)<br><br>Lunch at Rosengarten or Marzili (lunch-packages)<br><br>Free time in Berne city<br><br>Zytglogge Tour (1h)<br><br>Farewell Dinner (Tbc)<br><br>Coach transfer to Winterthur | | |
| 12 pm | Lunch Mensa | Lunch Mensa | Lunch Mensa | Lunch Mensa | | | |
| 1 - 5 pm | **Data Science Project**<br>- Project work in groups and individual supervision | **Data Science Project:**<br>- Project work in groups and individual supervision | **Data Science Project**<br>- Project work in groups and individual supervision | **Data Science Project**<br>- Project presentations and discussions in front of a jury<br>- evaluation<br>- celebration and reception | | | |
| 6pm | Dinner for US guests in a restaurant | Dinner for US guests in a restaurant | Dinner for US guests in a restaurant | Dinner for US guests in a restaurant | | | |
| Night | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | Hostel Depot195 | | |

## Week 3: Deep Learning
## Lecturer: Dr. Denton Bobeldyk
## Campus GVSU, Allendale, Michigan, USA, room: MAK B2235

| | Monday July 15th | Tuesday July 16th | Wednesday July 17th | Thursday July 18th | Friday July 19th | Saturday July 20th | Sunday July 21st |
|---|---|---|---|---|---|---|---|
| 7:30 – 9 am | Welcome breakfast Swiss guests, GVSU and ZHAW MAK D-2-227 | Breakfast Swiss guests MAK C-2-100 | Breakfast Swiss guests MAK C-2-100 | Breakfast Swiss guests MAK C-2-100 | Breakfast Swiss guests before 7:30 hrs, MAK C-2-100 | **Tour historic Fort Michilimackinac**, and ferry to **Mackinac Island** | **Free time:** relax or shopping.<br><br>In the afternoon, you may want to spend time on the **Grand Haven beach** with its amazing sunsets |
| 9 am - 12 pm | **Lecture:**<br>- Convolutional Neural Networks<br>- Deep learning evaluation methods<br><br>**Group Lab** | **Lecture:**<br>- Deep learning dataset management and augmentation<br><br>**Group Lab** | **Lecture:**<br>- Deep learning evaluation methods<br>- Autoencoders & GANs<br><br>**Group Lab** | **Introduction to Group Deep Learning Project Lab** and presentation preparation | 7:30 **Excursion to Sleeping Bear Dunes**<br><br>Hike dune climb and trail and to Lake Michigan<br><br>Lunch and swimming on Lake Michigan<br><br>**Catamaran Ride:**<br><br>Enjoy the views of Traverse Bay relaxing on a large catamaran.<br><br>Coach to Mackinaw City, MI | Late afternoon: coach back to Allendale | Lunch and dinner on your own.<br><br>**Grand Haven Musical Fountain** |
| 12 pm lunch | Lunch cafeteria, MAK D-2-227 | Lunch cafeteria, MAK D-2-227 | Lunch cafeteria, MAK D-2-227 | Lunch cafeteria, MAK D-2-227 | | | |
| 1 – 5 pm | **Group Deep Learning Project Lab**<br><br>Morning Lecture<br>Review Kahoot | **Group Deep Learning Project Lab**<br><br>Morning Lecture<br>Review Kahoot | **Group Deep Learning Project Lab**<br><br>Morning Lecture<br>Review Kahoot | **Group Deep Learning Project** Presentations and Discussions<br>- Evaluation<br>- Celebration | | | |
| 5:30 pm dinner | Dinner cafeteria, MAK D-2-227 | Dinner cafeteria, MAK D-2-227 | Dinner cafeteria, MAK D-2-227 | Dinner cafeteria, MAK D-2-227 | Overnight stay in hotel in Mackinaw City, MI | Dinner cafeteria, MAK D-2-227 | No organized dinner |
| Night | GVSU Dormitory | GVSU Dormitory | GVSU Dormitory | GVSU Dormitory | | GVSU Dormitory | GVSU Dormitory |

## Week 4: Data Visualization
## Lecturer: Dr. Jonathan Leidig
## Campus GVSU, Allendale, Michigan, USA, room: MAK B2235

| **Date Time** | **Monday July 22nd** | **Tuesday July 23rd** | **Wednesday July 24th** | **Thursday July 25th** | **Friday July 26th** | **Saturday July 27th** |
|---|---|---|---|---|---|---|
| 7:30 – 8 am | Breakfast Swiss guests<br><br>MAK C-2-100 | Breakfast Swiss guests<br><br>MAK C-2-100 | Breakfast Swiss guests<br><br>MAK C-2-100 | Breakfast Swiss guests<br><br>MAK C-2-100 | Breakfast Swiss guests<br><br>MAK C-2-100 | Breakfast at hostel |
| 8 am – 12 pm | **Lecture:**<br>- Intro to visualization<br>- Design principles<br><br>**Exercises:**<br>- Human cognition<br>- UX concepts | **Lecture:**<br>- Descriptive chart design<br>- Persona & task modeling<br><br>**Exercises:**<br>- Gestalt psychology<br>- User/persona modeling<br>- Task modeling | **Lecture:**<br>- Multi-dimensional datasets<br>- Overviews, navigation, and exploration with large datasets<br>**Exercises:**<br>- Group project | **Lecture:**<br>- Tree, network, & spatial analysis<br>- Persuasion<br><br>**Exercises:**<br>- Group project | **Travel to Chicago**<br><br>Free sightseeing time.<br><br>e.g. See the city skyline from out in Lake Michigan: Shoreline boat tour, or from over 300 meters above the streets in the 94th floor of the John Hancock Building. | **Free Time in Chicago and closure of summer school**<br><br>Transfer to Zürich<br><br>Or<br><br>Continue travelling in the US |
| 12 pm Lunch | Lunch cafeteria,<br>MAK D-2-227 | Lunch cafeteria,<br>MAK D-2-227 | Lunch cafeteria,<br>MAK D-2-227 | Lunch cafeteria,<br>MAK D-2-227 | | |
| 1 – 5 pm | **Visual analytics projects:**<br>- Exploratory data analysis lab with Tableau | **Visual analytics projects:**<br>- Statistical charts lab with programming libraries | **Visual analytics projects:**<br>- Visualization design with D3, Gephi, GIS, or Google Cloud Platform packages | **Visual analytics project:**<br>- Project work in groups and individual supervision<br>- Project presentations<br>- Evaluation<br>- Celebration | | |
| 5:30 pm Dinner | MAK D-2-227 | MAK D-2-227 | MAK D-2-227 | Farewell Dinner, The Meadows Clubhouse | Free time in Chicago | |
| Night | GVSU<br>Dormitory | GVSU<br>Dormitory | GVSU<br>Dormitory | GVSU<br>Dormitory | Chicago Hostel-International | |