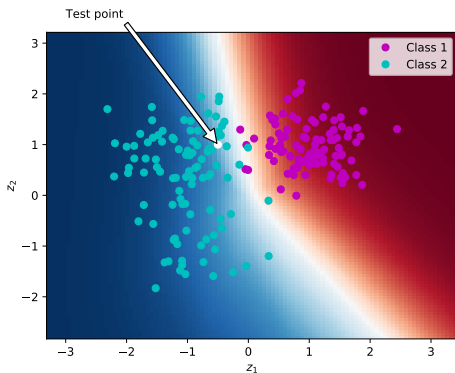
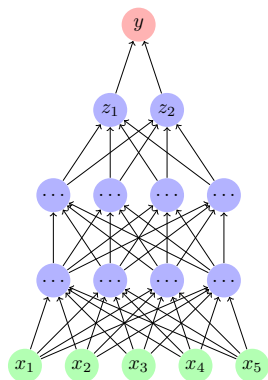


AI and Machine Learning in Healthcare

- Suggesting a diagnosis and treatment programme
- Predicting patient outcomes
- As a tool: Visualization, summarization,
- anomaly and event detection
- Knowledge discovery
- ...



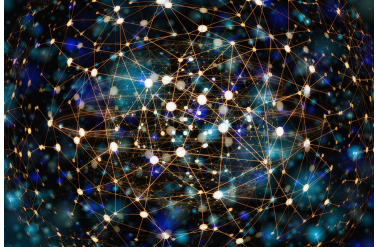
Machine Learning: A 1 Minute Tutorial



- Data points are patients, images, a segment of EEG signal, ...
- Class labels are positive/neg. for disease, condition type, ...
- Goal: Build a model and deploy it for new test points

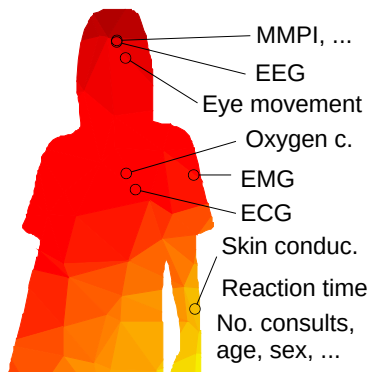
Current Challenges

- Asking the right questions
- Getting high quality data
- Tolerating the “black box” vs Obtaining an interpretation
- Knowing when and how to accept conclusions



Example: Diagnosing and Treating Sleep Disorders

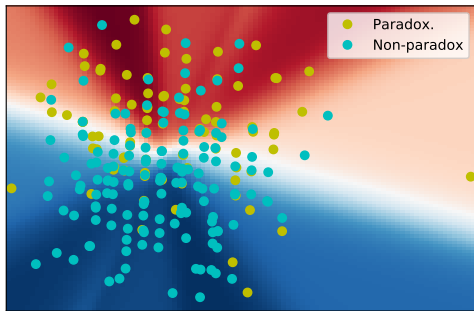
- Insomnia affects around 10% of the population,
- predisposes to other disorders
- Difficult to diagnose and treat efficiently, because of subjectivity involved, varying treatment
- A large amount of data per patient:



Paradoxical insomnia (false perception of not sleeping) is an issue:

- Unlikely to be treated successfully
- Expensive (time, data, money) to detect/classify

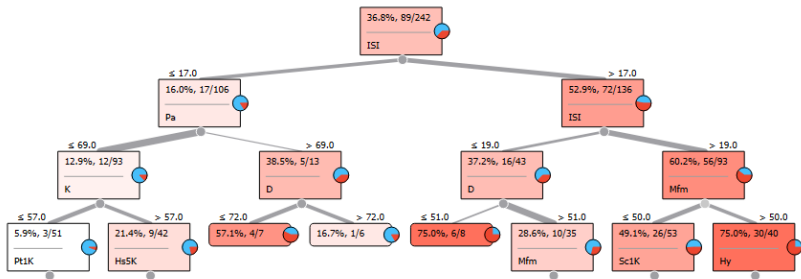
A subset of one questionnaire already provides some separation:



i.e., an *option* to quickly screen, redirect treatment early

Separability (giving an answer) is not enough. Responsibility of AI tools:

- Providing an *interpretable* result (for medical expert, patient, data expert)
- Supported statistically
- Adaptability



A decision tree for potential early re-assignment of paradoxical insomnia cases

Already improving the treatment process

Research & Tech in Tomorrow's Medicine

We need more:

- Data
- Collaboration and interaction between medicine and tech
- Interpretability / *explainability*

