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Machine Learning
Data Classification and training through domain experts

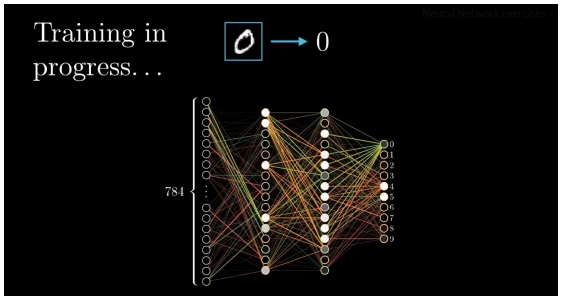
Iterata Health Platform supports the identification of cluster which in turn supports the decision-making process.

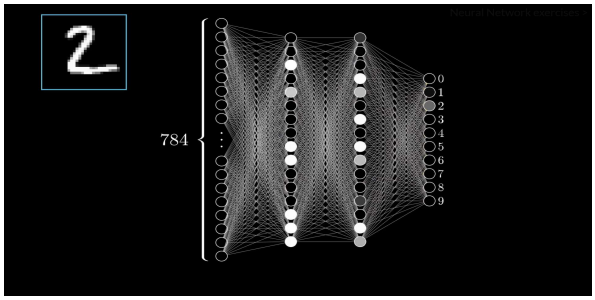
Classification & Training

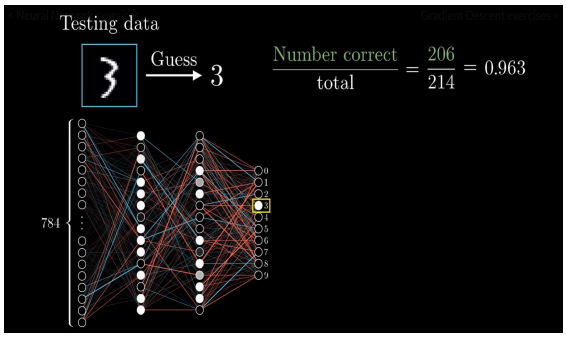
Cluster recognition & Training

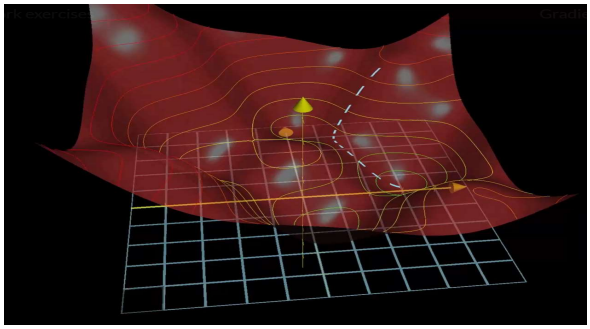
Cluster recognition can be important in various fields, like in medicine, where patterns of symptoms or medication combinations can be identified, in pharma industries to identify the demographical distribution of their products, but also in other fields like the banking and insurance system.

A classifier distributes data points into different categories. However in a first step, the system needs to get familiar with the different categories and needs to be trained to decide which data point belongs in which category. So, a classifier learns by means of a training data set who the input data is related to the category/class. For example, if the system has to decide whether a face belongs to the gender male or female, it first has to learn which features distinguishes between these two categories. In this step, the data is structured and labeled manually, and an appropriate learning rate has to be set. After labelling, the network architecture is defined and then trained. Before using it on the actual data of interest, it needs to be validated.
In a data set with sensitive data (personal data), an expert takes over the assembling of an appropriate training set to maximize the sensitivity. The aim is to get as less false negative and false positive results as possible.
After the training phase and minimizing the error rate, the algorithm can be applied on to the data of interest.
More complex opportunities can be developed as well. We are currently working on a tool that should facilitate the classification of chest x-rays where data is compared to a training set including different pictures of x-rays with different diagnoses. This supports the decision-making process enormously.









Examples

- Medical diagnosis, Radiological classification, structuring of medical history data to extract only a certain part

Please do not hesitate to contact us
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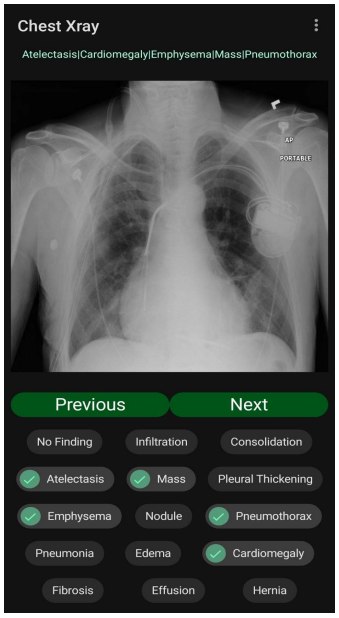
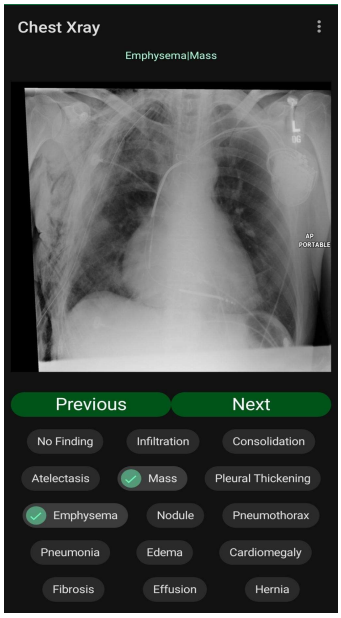
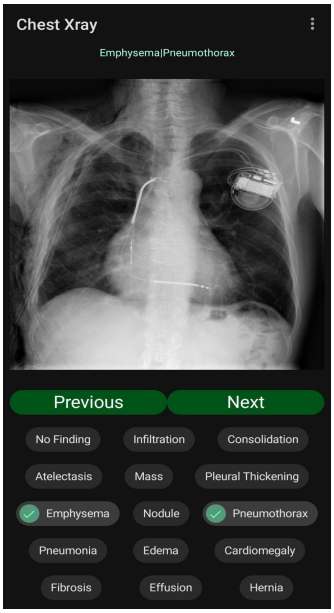
Chest Xray: Machine Learning Validation & Classification

Source NHI: https://nihcc.app.box.com/v/ChestXray-NIHCC







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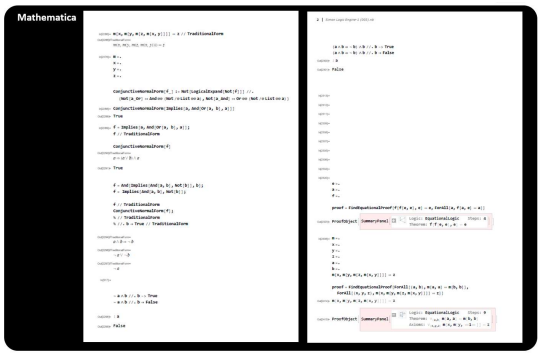
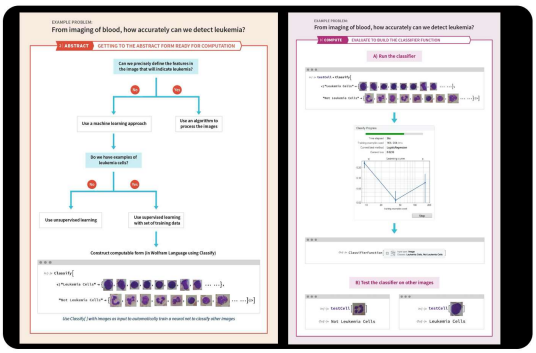
No Finding	60 361
Infiltration	19 894
Effusion	13 317
Atelectasis	11 559
Nodule	6331
Mass	5782
Pneumothorax	5302
Consolidation	4667
Pleural_Thickening	3385
Cardiomegaly	2776
Emphysema	2516
Edema	2303
Fibrosis	1686
Pneumonia	1431
Hernia	227

Out[- JJTableForm-

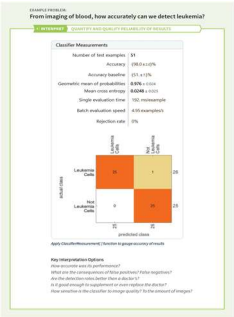
No Finding	60 361
Infiltration	9547
Atelectasis	4215
Effusion	3955
Nodule	2705
Pneumothorax	2194
Mass	2139
Effusion | Infiltration	1603
Atelectasis | Infiltration	1350
Consolidation	1310
Atelectasis | Effusion	1165
Pleural_Thickening	1126
Cardiomegaly	1093
Emphysema	892
Infiltration | Nodule	829
Atelectasis | Effusion | Infiltration	737

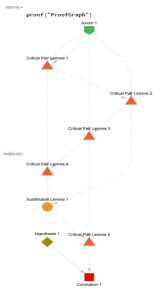


Logic Engine – Classifier



Classifier – Expert Trained Set (Neuronal Network)





Classifier Measurement

Speed on

1. Descision-Support
2. Novel Tools (Werkzeuge)
3. Tools for Domain usable / fast available