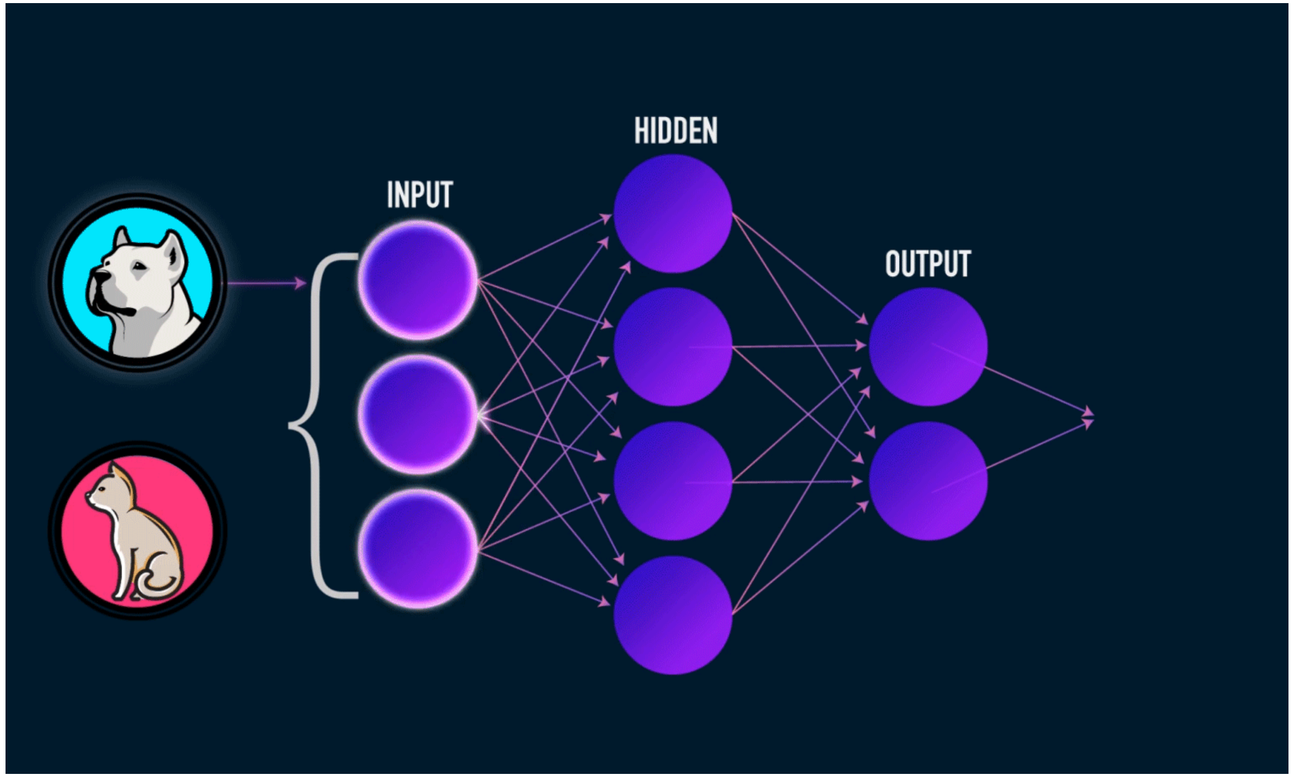
Deep Learning with fast.ai



Lewis Tunstall | Fribourg ML Meetup | 31.7.2019

Core Applications

Focused on ***supervised learning***

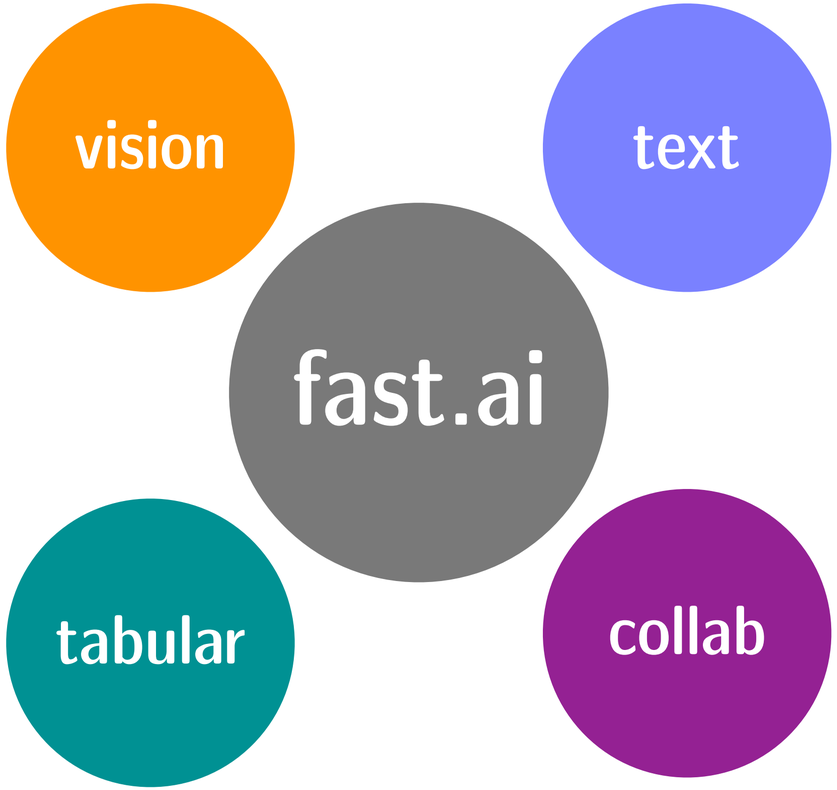
Consistent API across modules:

- transform
- data
- models
- learner

Docs as code (see `docs_src/` in repo)!

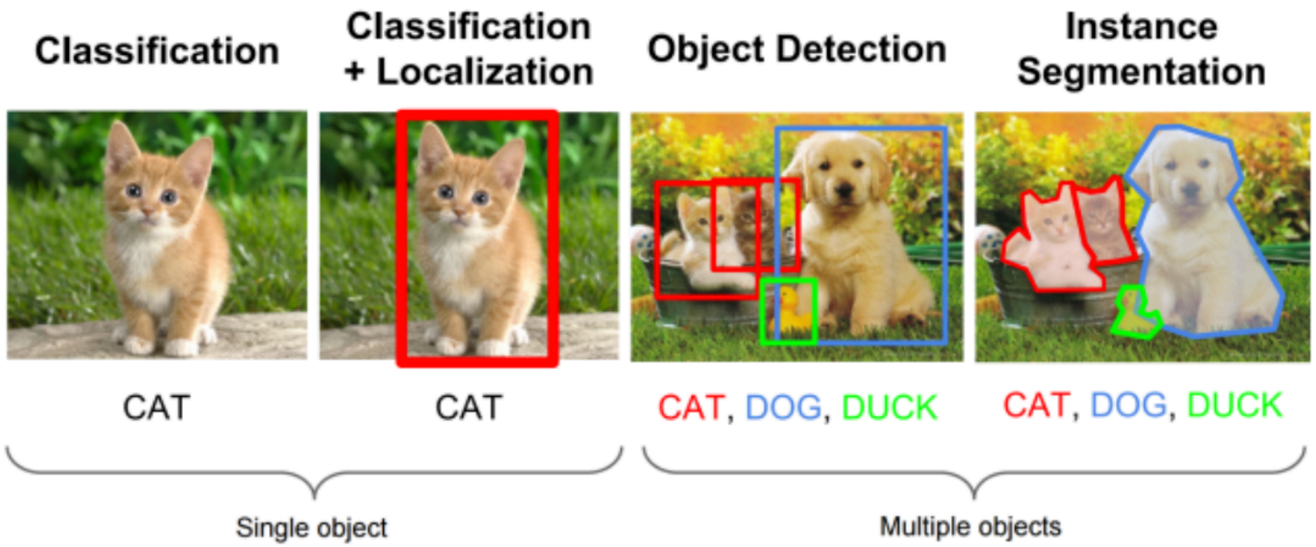
Fast prototyping:

```
from fastai.[APPLICATION] import *
```



Computer Vision

The `vision` module is the most developed in the library and leverages power of ***transfer learning*** (see lessons 1, 3 & 7 of the fast.ai MOOC)

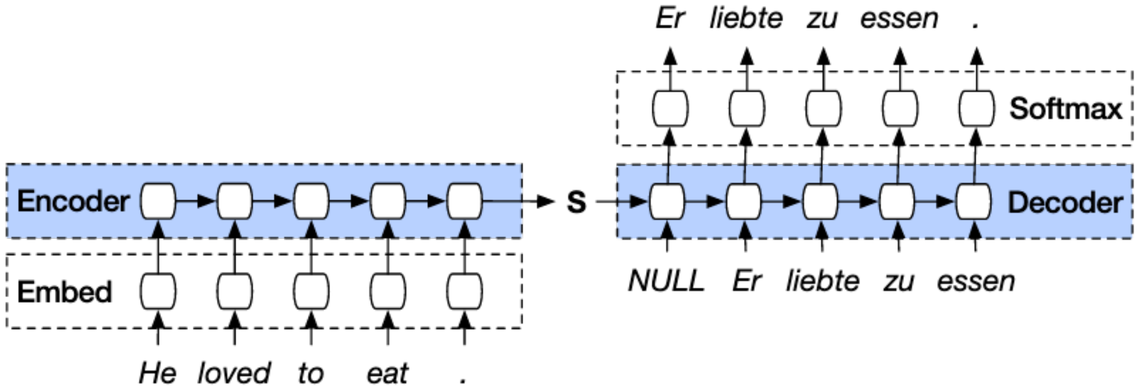


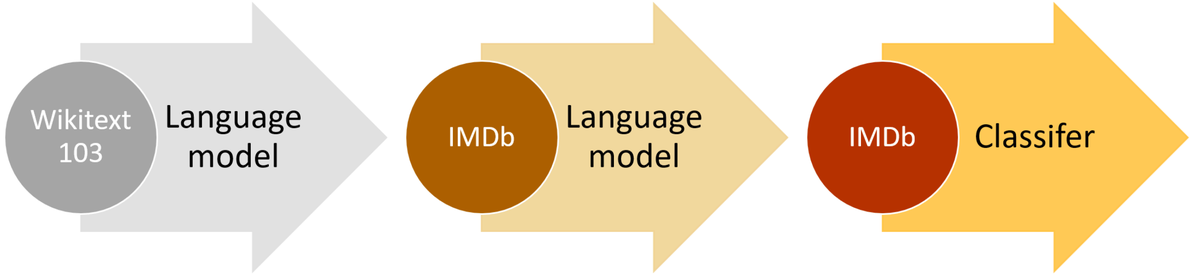
(source here)

GANs & Colourisation
(source: DeOldify)

Natural Language Processing

The `text` module implements ULMFiT to apply pretrained language models to NLP tasks (see lessons 3, 4 & 12 of the fast.ai MOOC)



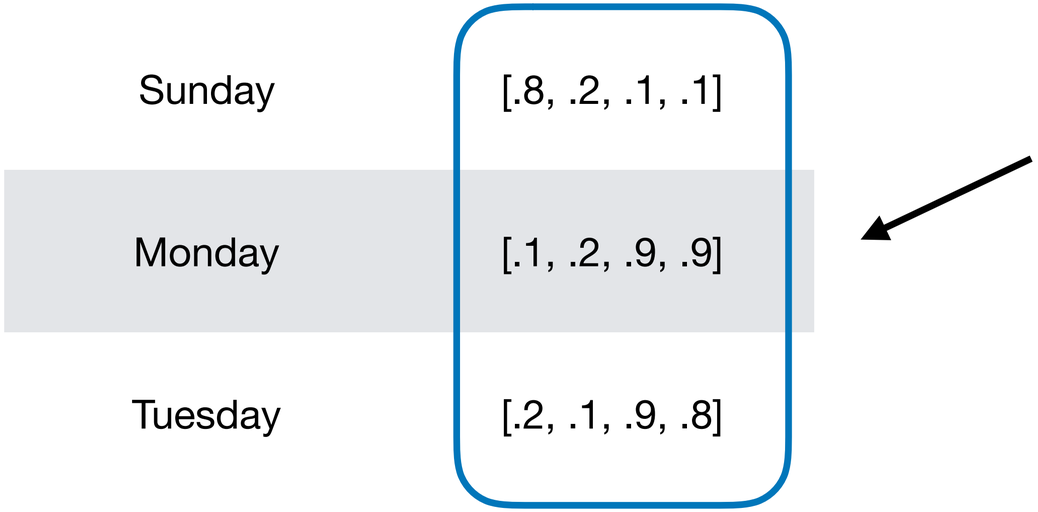


Neural translation also possible (see here)

Tabular

The `tabular` module provides the means to apply deep learning to ***structured / tabular*** data (see lesson 4 of the fast.ai MOOC)

Key idea: use ***embeddings for categorical variables***

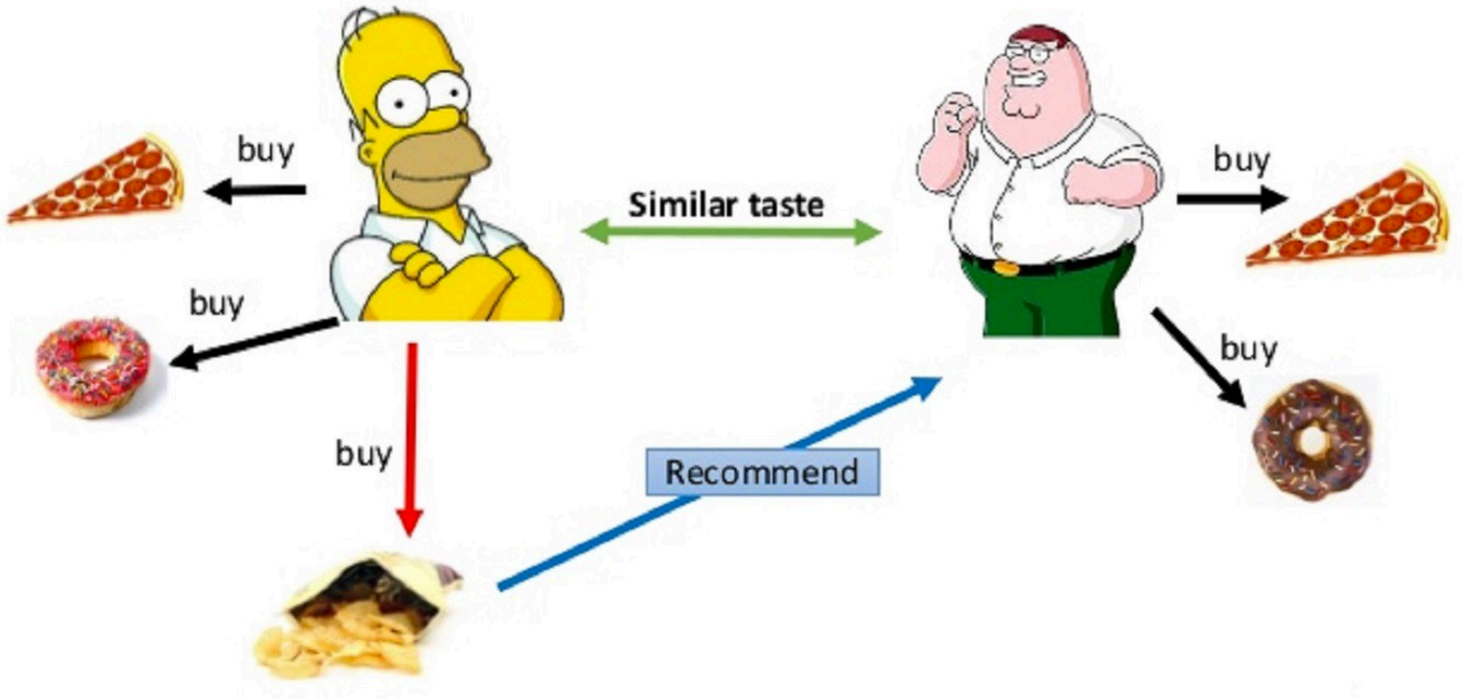


Represent each category by a vector of floating point numbers. NN learns best representations during training

NB: Less developed and requires tuning to compete with other methods

Collaborative Filtering

The `collab` module provides the means to predict how much a user will like a certain item (e.g. Netflix shows, Amazon books etc)



NB: Less developed than vision and text modules

Group Projects

Several places to get inspiration from:

- Blindness detection [vision]
- Pneumothorax segmentation [vision]
- Cellular image classification [vision]
- Toxic comments classification [text]

fast.ai

- Datasets
- Forums
- Build a web app

- Own ideas
- Apply deep learning to own research or business use case