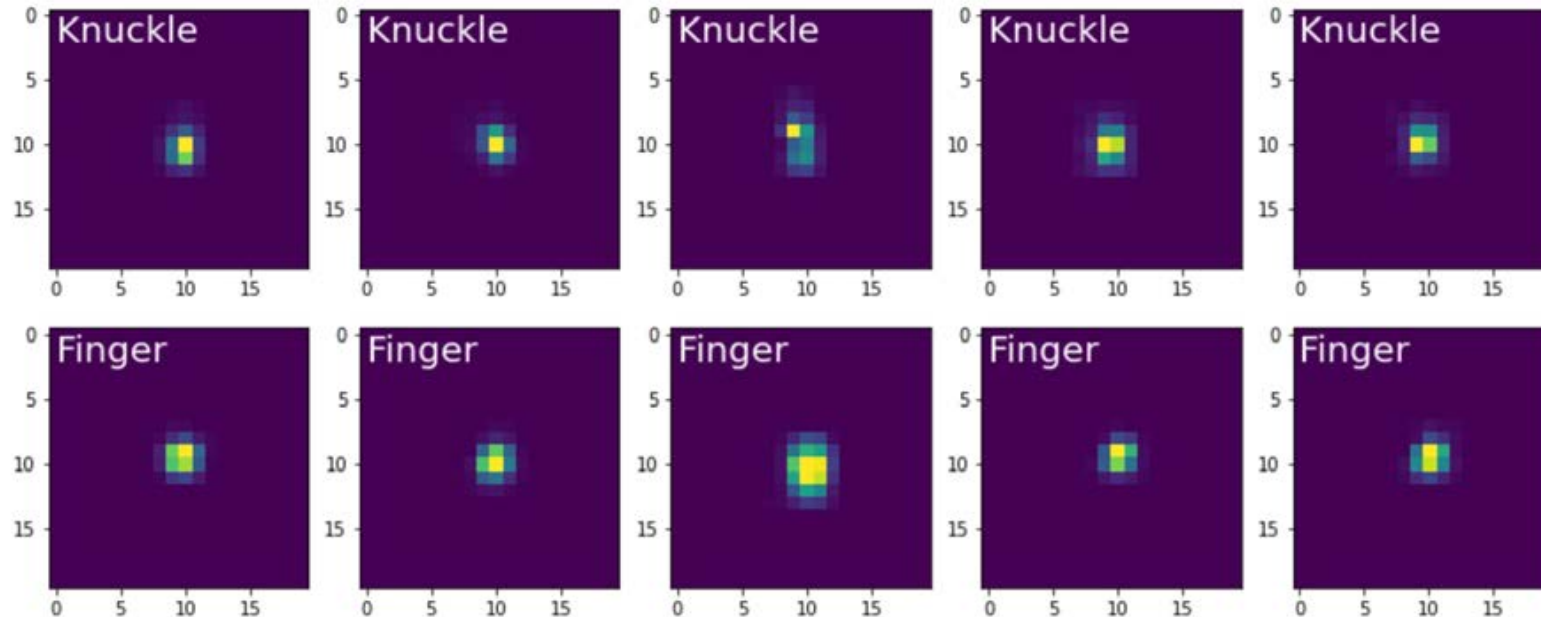# Practical Machine Learning

Feature Engineering & Representation Learning
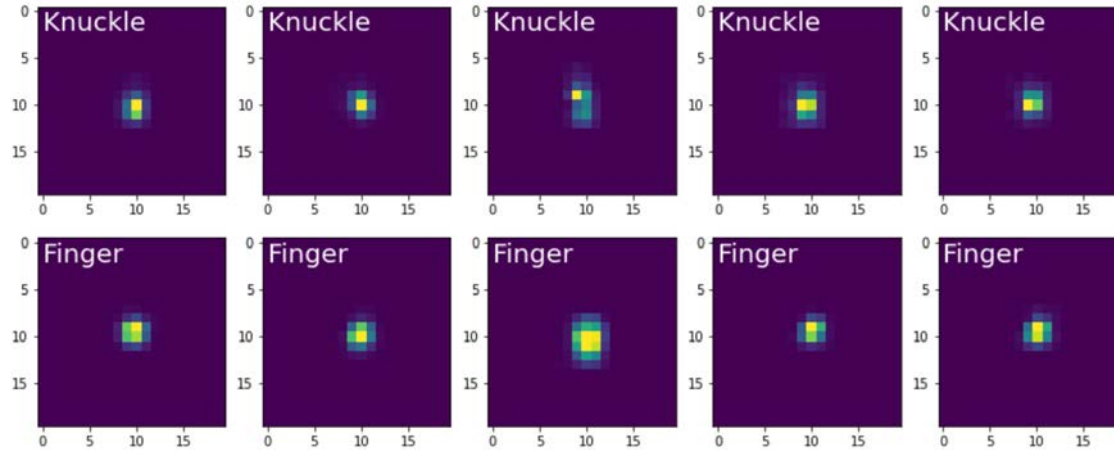
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Feature Engineering

- Feature Engineering is often used for non NN ML e.g. SVM
- Requires domain knowledge and "thinking" before training

Feature Engineering

- Sum of pixels
- Min/Max value
- Ellipse fitting
  - Radius 1 & 2
  - Theta
- Area of the Convex hull
- …
- … And others we can think of depending on our problem

Representation Learning

- The data gets presented into the model without additional preprocessing

- No domain knowledge

- No thinking

- **The hope** is that the model is doing the "thinking" for you

Pros and Cons

- Feature Engineering
  - Reduced the input data
  - → models can be smaller
  - → more suitable for "traditional" ML models

- Representation Learning
  - Raw data as input
  - → the models needs to do more "work"
  - → the model has to be larger
  - → Harder to train
  - → more suitable for NN models

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Conclusion
Feature Engineering & Representation Learning

- Feature Engineering

- Representation Learning

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