50 Years of ICPR: 1974-2024

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Pattern Recognition

By pattern recognition we mean the extraction of the significant features from a background of irrelevant detail. … it is the kind of thing that brains seem to do very well….that computing machines do not do very well yet. **O. G. Selfridge, 1955**
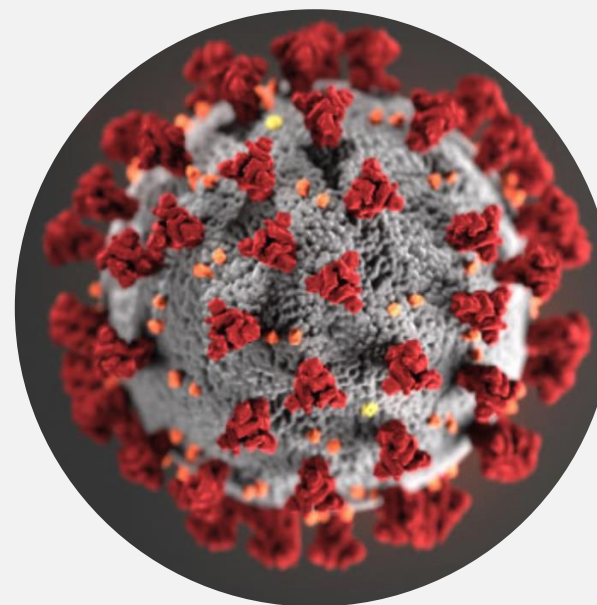
Selfridge, "Pattern recognition and modern computers." In Proceedings of the Western Joint Computer Conf, pp. 91-93. March 1-3, 1955.
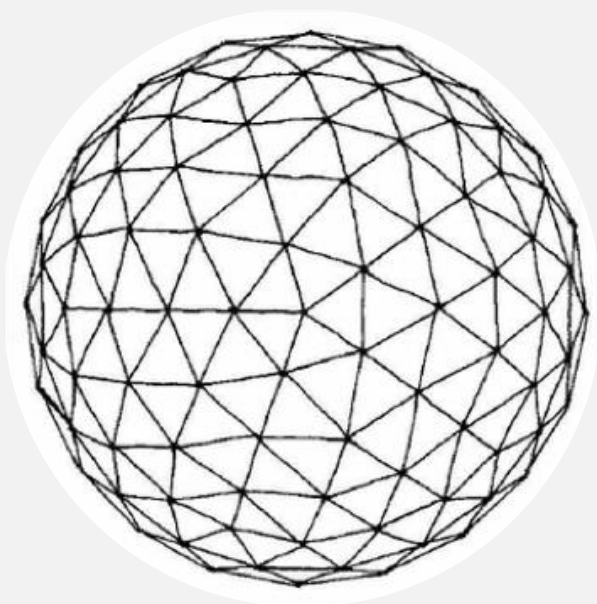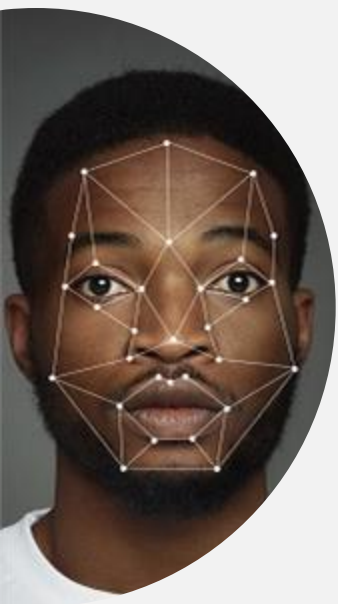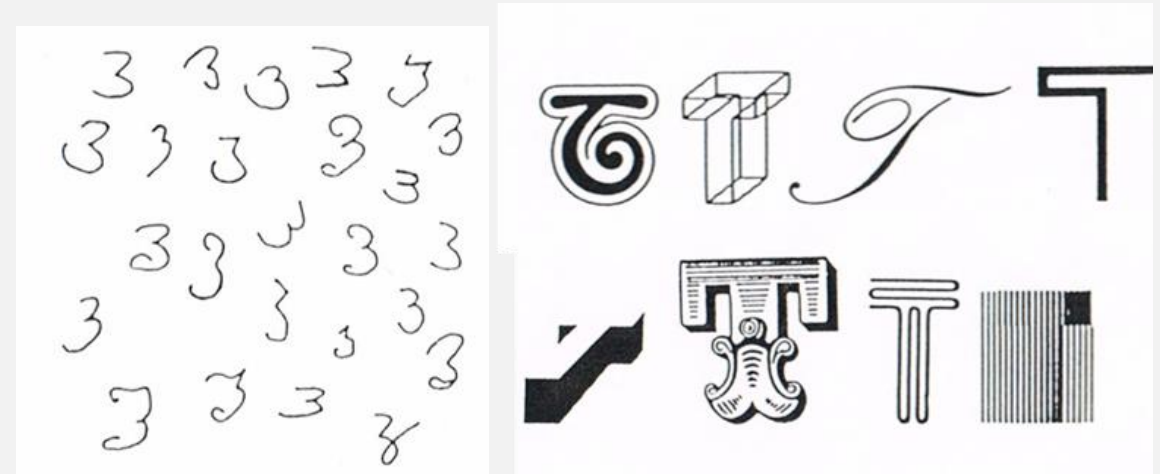
What is a Pattern?

A pattern is the opposite of a chaos; it is an entity vaguely defined, that could be given a name.

S. Watanabe, 1985

Pattern Class

- Collection of similar, not necessarily identical, patterns
- Class is defined by a model or examples
- How to define similarity? fundamental to intelligent systems

American Elm

Ginkgo

Wallow

Spruce

Larch

Birch

Palm

Intra-class Variability

Inter-Class Similarity

Learn a compact & discriminative representation for pattern classes

www.cbsnews.com/8301-503543_162-57508537-503543/chinese-mom-shaves-numbers-on-quadruplets-heads

50 Years of ICPR: Then and Now

- Research Problems (large C, d, n); Fisher's Iris data (3 classes, 4 features, 50 sample/class) to ImageNet

- Benchmark data sets (privacy regulations for PII; face, voice,…)

- Processors and memory (never enough)

- End-to-end system performance (metrics: accuracy alone is not adequate, throughput, RoI, robustness, template size, cost)

- Approach: model-driven to data-driven (e.g., Gaussian models to deep networks)

- Model selection and fusion

- Data labeling challenges

- Synthetic data generation (domain gap)