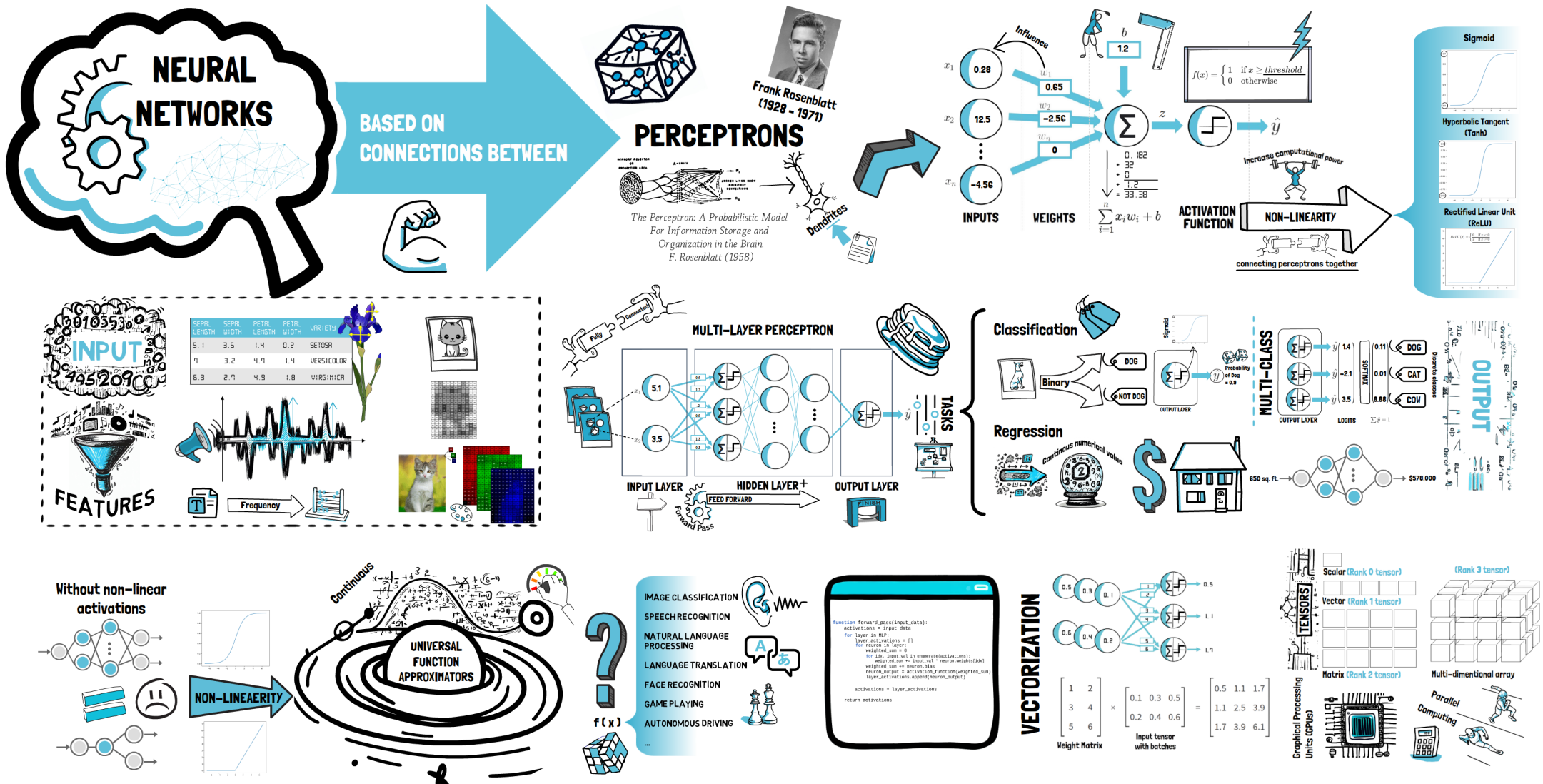
NEURAL NETWORKS
BASED ON CONNECTIONS BETWEEN
PERCEPTRONS
Frank Rosenblatt (1928 - 1971)
The Perceptron: A Probabilistic Model For Information Storage and Organization in the Brain. F. Rosenblatt (1958)
Dendrites
Influence
INPUTS
WEIGHTS
ACTIVATION FUNCTION
NON-LINEARITY
connecting perceptrons together
Increase computational power
Sigmoid
Hyperbolic Tangent (Tanh)
Rectified Linear Unit (ReLU)
INPUT
FEATURES
Frequency
MULTI-LAYER PERCEPTRON
INPUT LAYER
HIDDEN LAYER
OUTPUT LAYER
FEED FORWARD
Forward Pass
TASKS
Classification
Binary
DOG
NOT DOG
MULTI-CLASS
SOFTMAX
Regression
Continous numerical value
650 sq. ft.
$578,000
OUTPUT
Without non-linear activations
NON-LINEAERITY
Continuous
UNIVERSAL FUNCTION APPROXIMATORS
f(x)
IMAGE CLASSIFICATION
SPEECH RECOGNITION
NATURAL LANGUAGE PROCESSING
LANGUAGE TRANSLATION
FACE RECOGNITION
GAME PLAYING
AUTONOMOUS DRIVING
VECTORIZATION
Weight Matrix
Input tensor with batches
TENSORS
Scalar (Rank 0 tensor)
Vector (Rank 1 tensor)
Matrix (Rank 2 tensor)
(Rank 3 tensor)
Multi-dimentional array
Graphical Processing Units (GPUs)
Parallel Computing