



EXTENDING ENTROPY BEYOND DDOS DETECTION

JAY HUNTER & BENJAMIN TRAN

WHAT IS CRITICAL INFRASTRUCTURE?

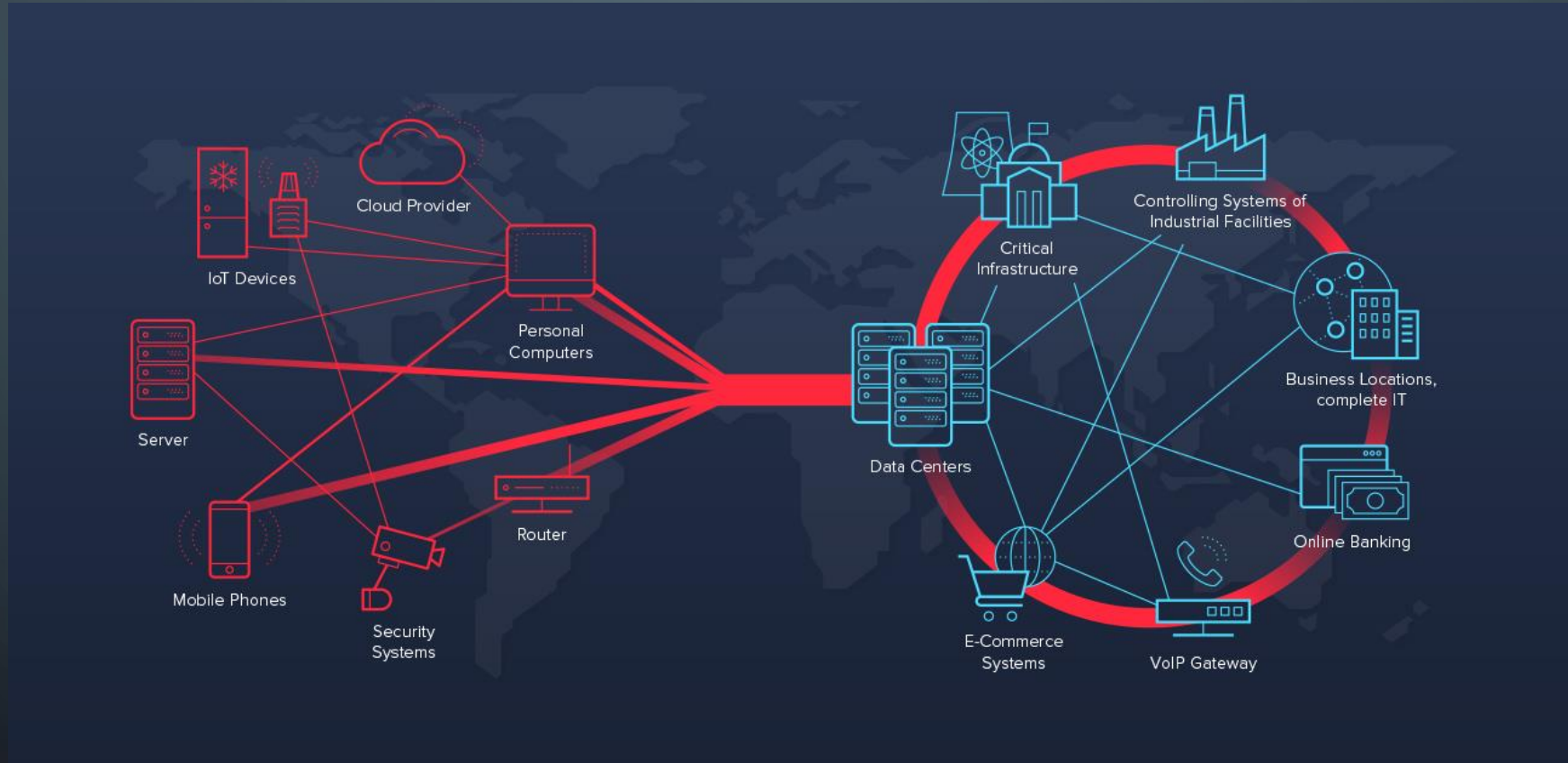


<https://www.energymagazine.com.au/north-brisbane-power-station-replacement-begins/>



<https://www.brisbanetimes.com.au/national/queensland/virus-fragments-found-at-seven-more-queensland-wastewater-treatment-plants-20210126-p56wz9.html>

WHAT IS A CYBER ATTACK?

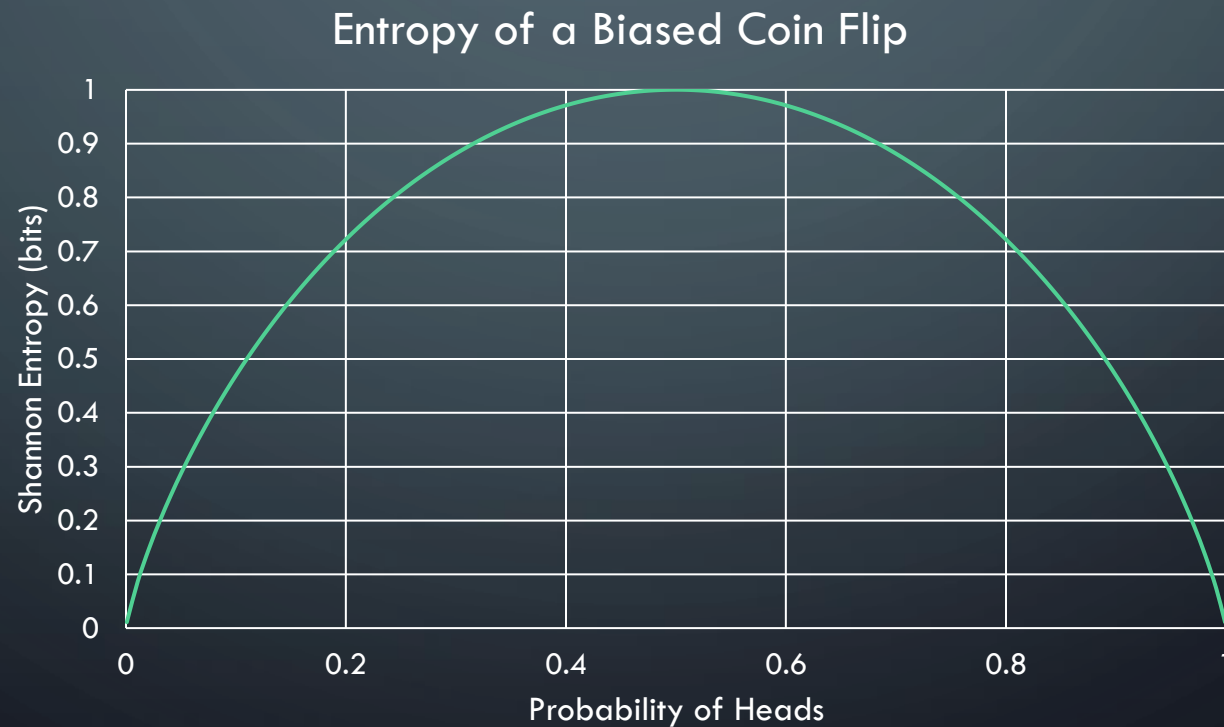


<https://www.link11.com/en/what-are-ddos-attacks/>

ANOMALY DETECTION AND MACHINE LEARNING

SHANNON ENTROPY

- Measure of uncertainty of a random process.
- Used predominately in DDoS detection





TRENDS IN CYBER ATTACKS



DIVERSITY



COMPUTATIONAL
POWER



FREQUENCY



DAMAGE



NEEDS OF DETECTION SYSTEMS



PERFORMANCE



VERSATILITY



TIME



EASE OF
INTEGRATION

PROCESS



Entropy
Computations

Algorithm
Training

Performance
Evaluation

PERFORMANCE METRICS

Accuracy

- How correctly is data classed?

Precision

- What proportion of detected attacks are actually attacks?

Recall

- How well are attacks detected?

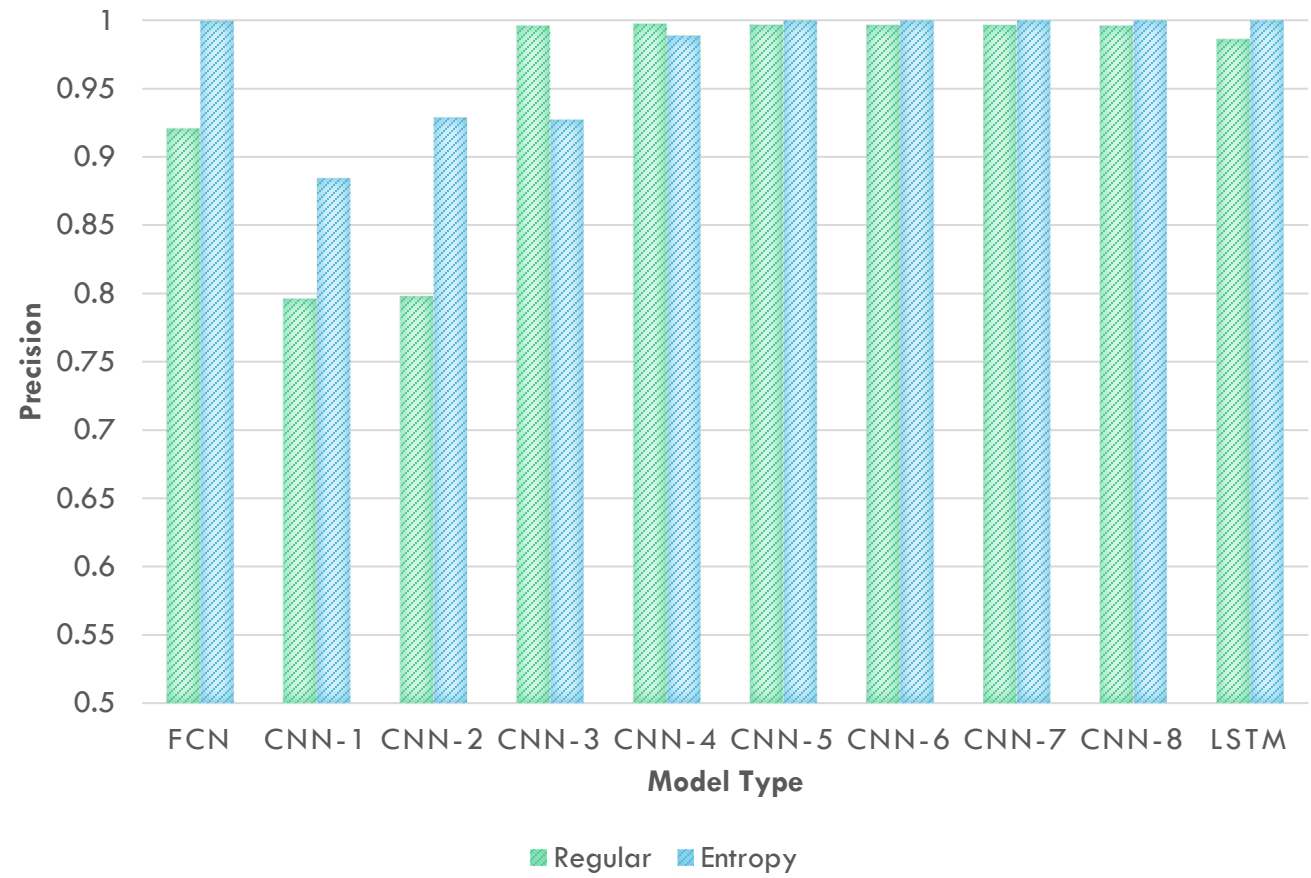
F1

- The harmonic mean between precision and recall

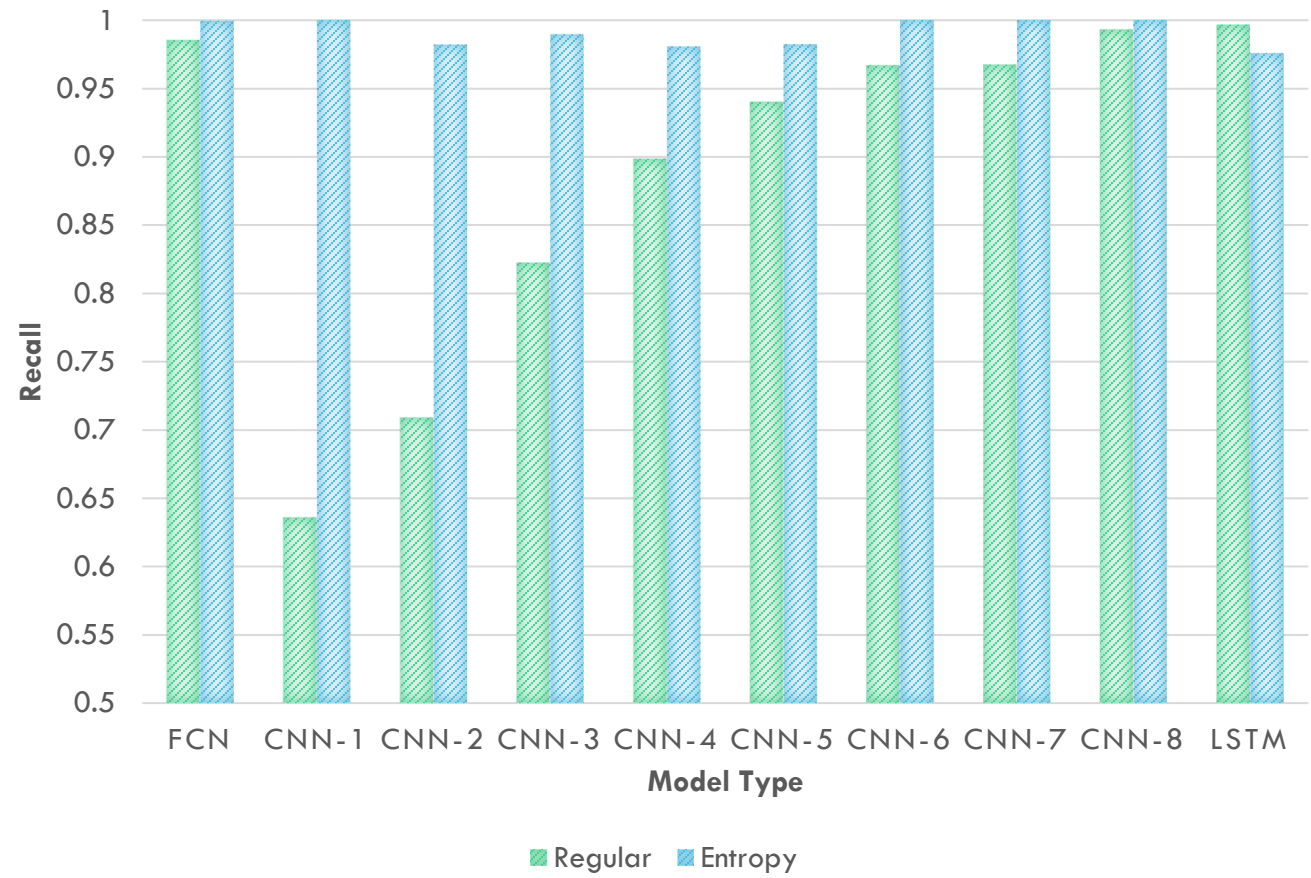
A close-up, low-angle shot of a glowing incandescent lightbulb against a dark blue background. The bulb is partially visible on the right side, with its internal filament and glass structure clearly illuminated. The text "DEEP LEARNING" is centered in the middle of the frame in a white, sans-serif font.

DEEP LEARNING

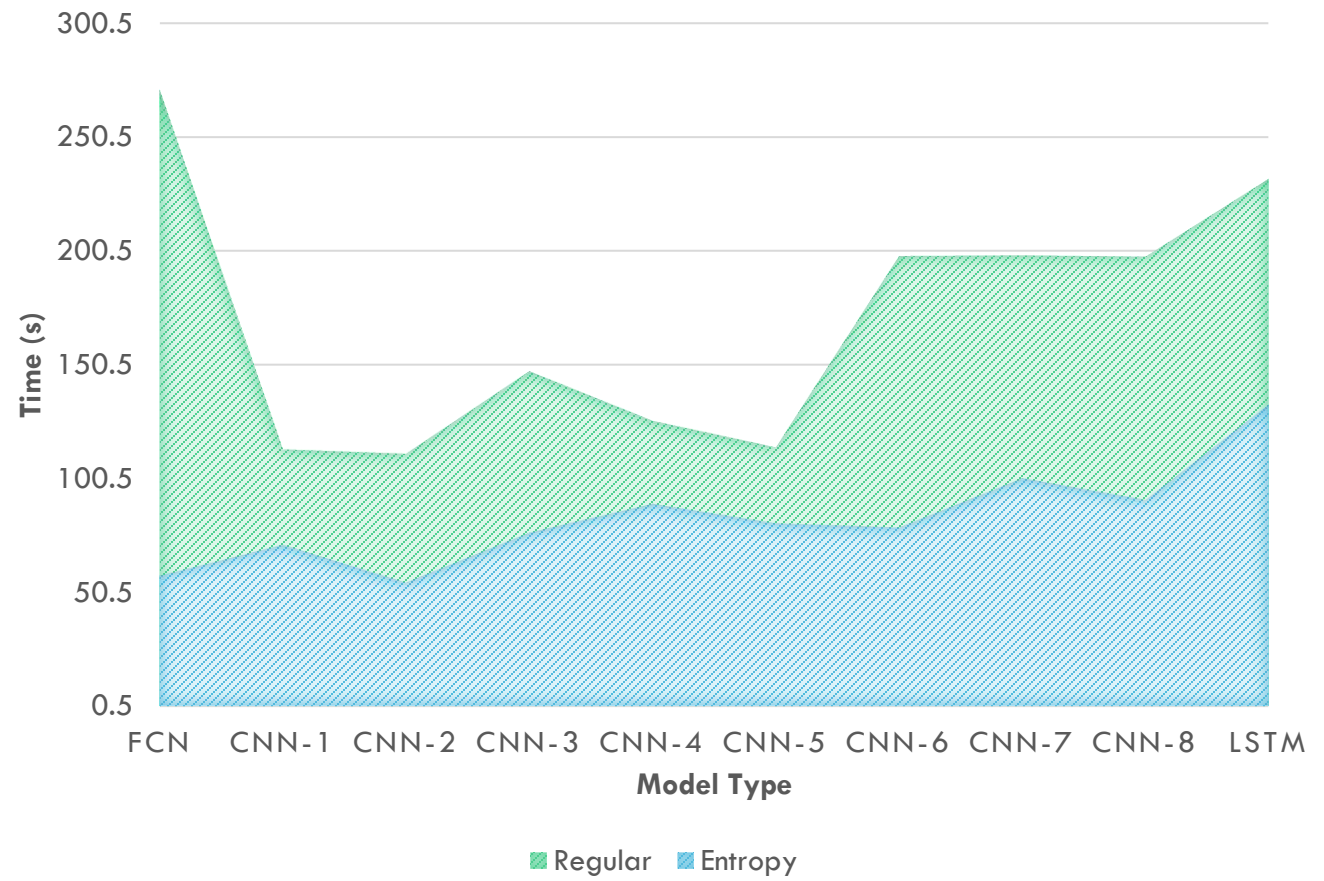
PRECISION



RECALL



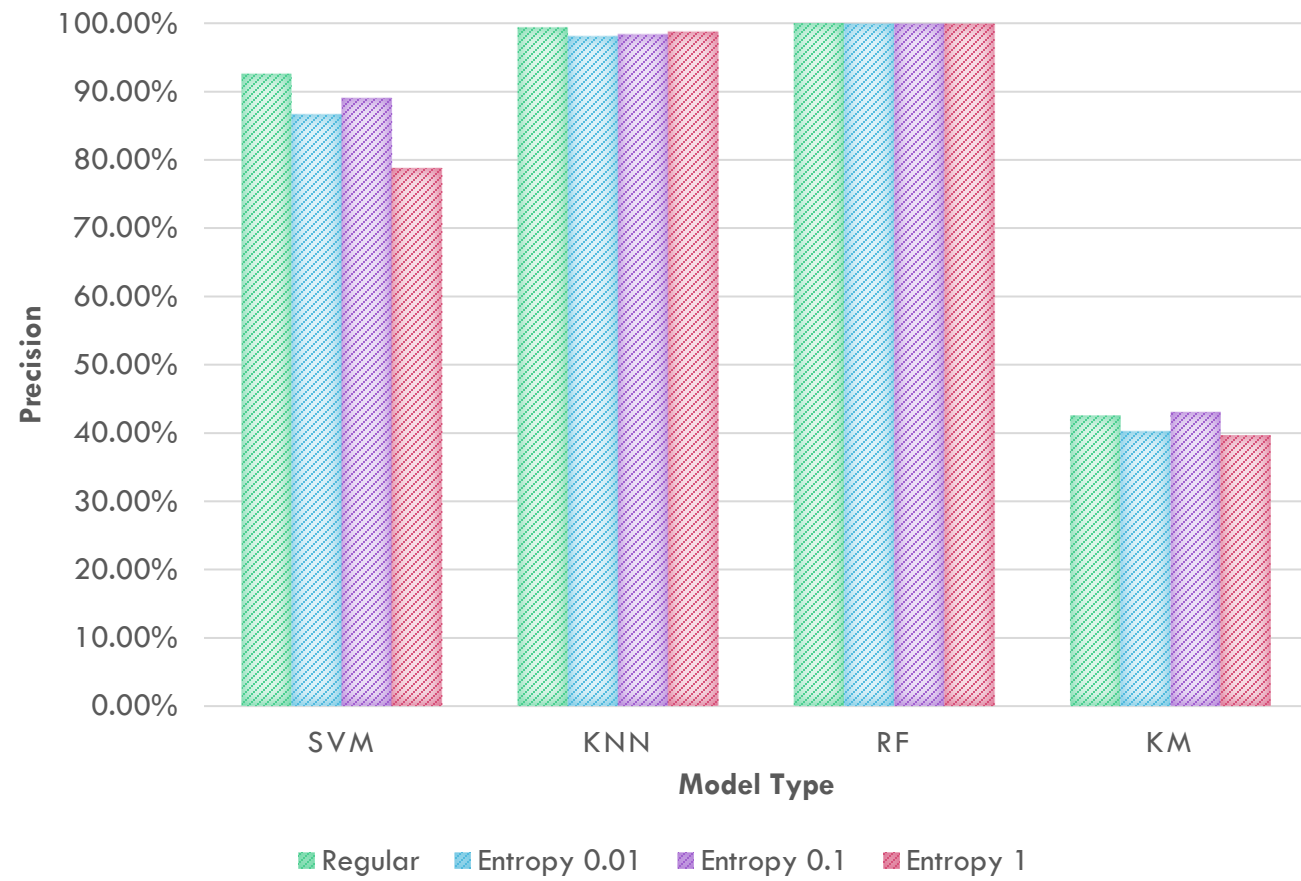
TIME



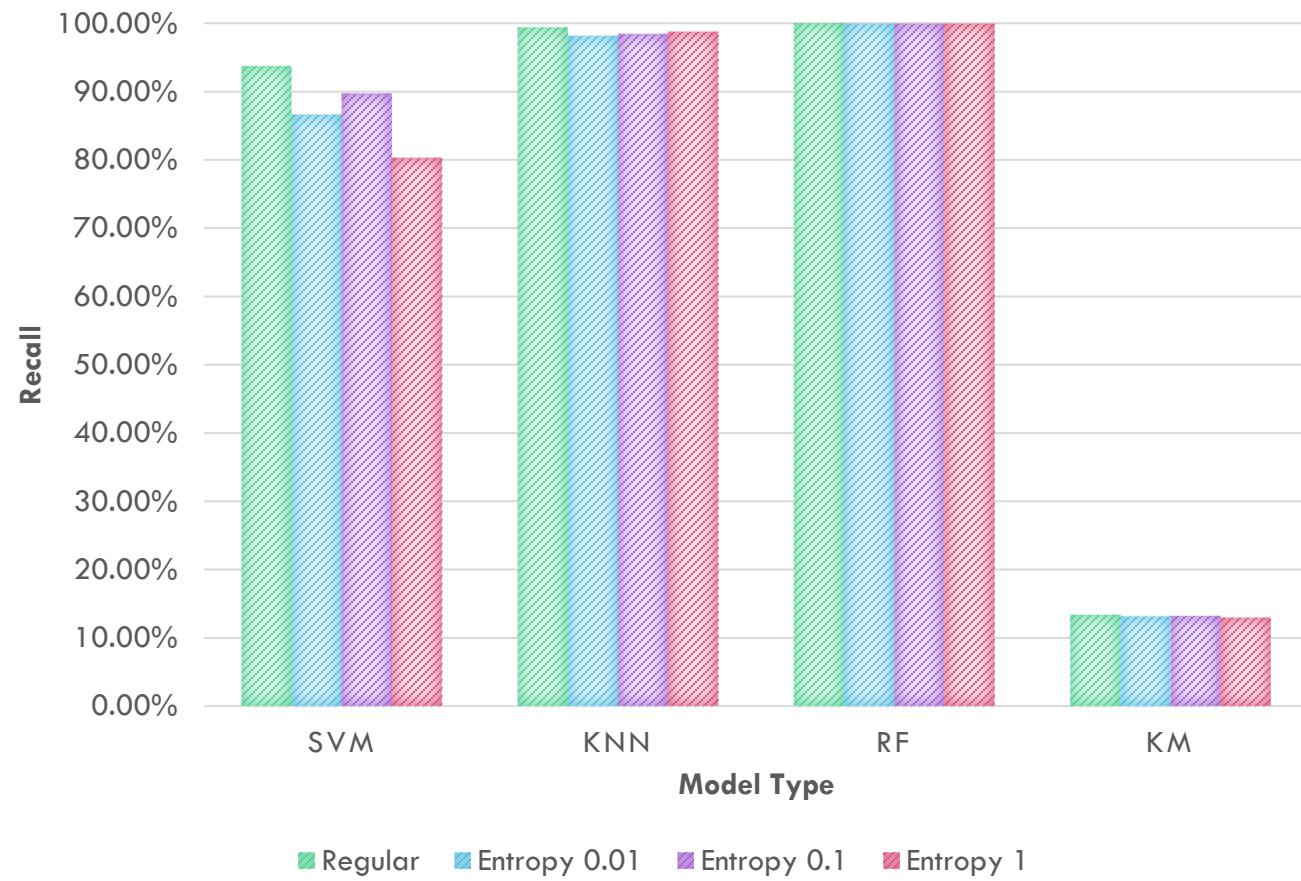
A close-up, low-angle shot of a glowing incandescent lightbulb against a dark blue background. The bulb is partially visible on the right side, with its internal filament and glass structure clearly shown. The light from the bulb creates a warm, golden glow. The text "SHALLOW LEARNING" is overlaid in white, sans-serif capital letters across the center of the image.

SHALLOW LEARNING

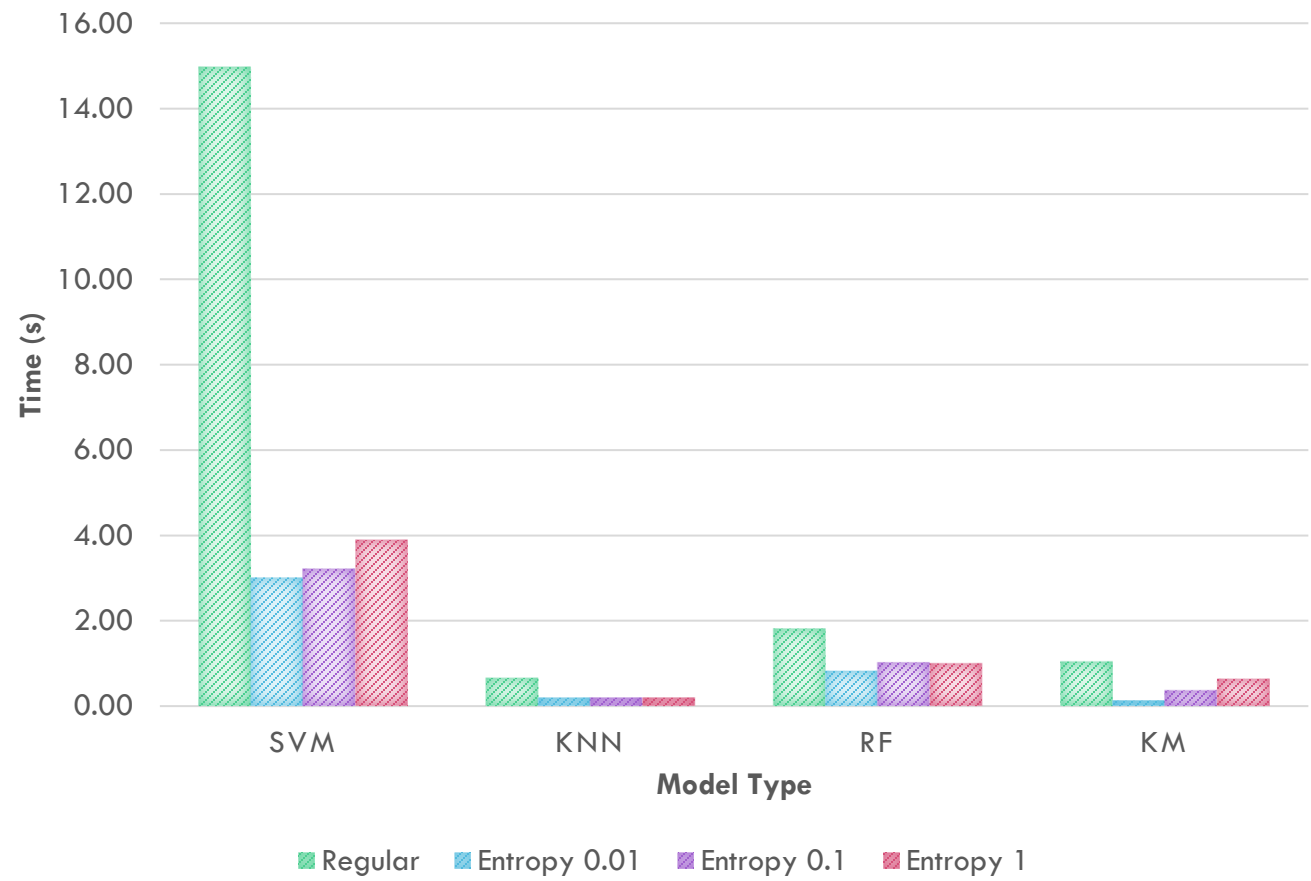
PRECISION



RECALL

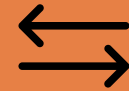


TIME





IMPLICATIONS OF OUR RESEARCH



ENTROPY IN
UNIVERSAL
SYSTEMS



USING FAST,
LOW-FIDELITY
METHODS

QUESTIONS?

CONTACT DETAILS

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