



Imagery Analysis Enhancement by the Synthetic Sensation Approach to Information Integration (SSAII)

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How do we learn and identify objects?

I suggest that we learn naturalistically by a fused synthesis process where natural sensation bandwidths, are combined cognitively to form a cohesive, mental model.

However, current technology has provided isolated bandwidth representations which are then cognitively forced, in a serial fashion, into a mental model.



Technology advancements in sensor fusion have allowed jet aircraft pilots to enhance their situation awareness and effectiveness because of fused sensor systems...why has this concept not been applied to other systems?





Current Imagery systems are individual, separate, and require divided attention, and cognitive synthesis to be fused into a cohesive concept

They are characterized by distinct bandwidth limits, each of which provides information, but all of which provide information which must be serially merged through cognitive processes into a cohesive single concept.

IR (Infrared)

EO (Electro-optical)

Radar

Radio



What would be the outcome if three or four, current visual imagery systems could be merged into one and enhanced by sensor fusion?

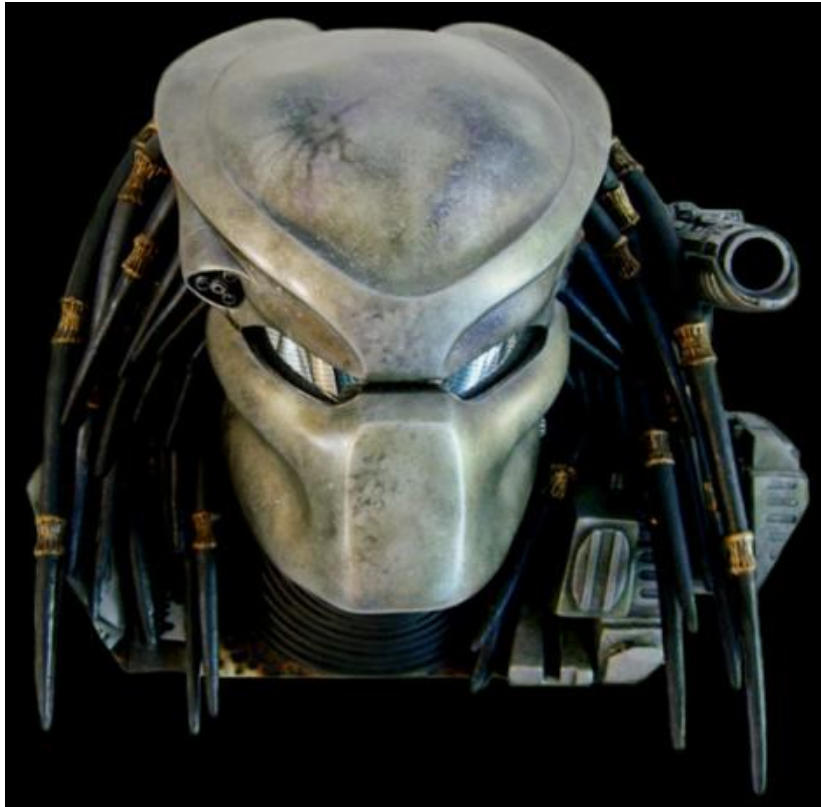
An analogy...



Two types of Predators



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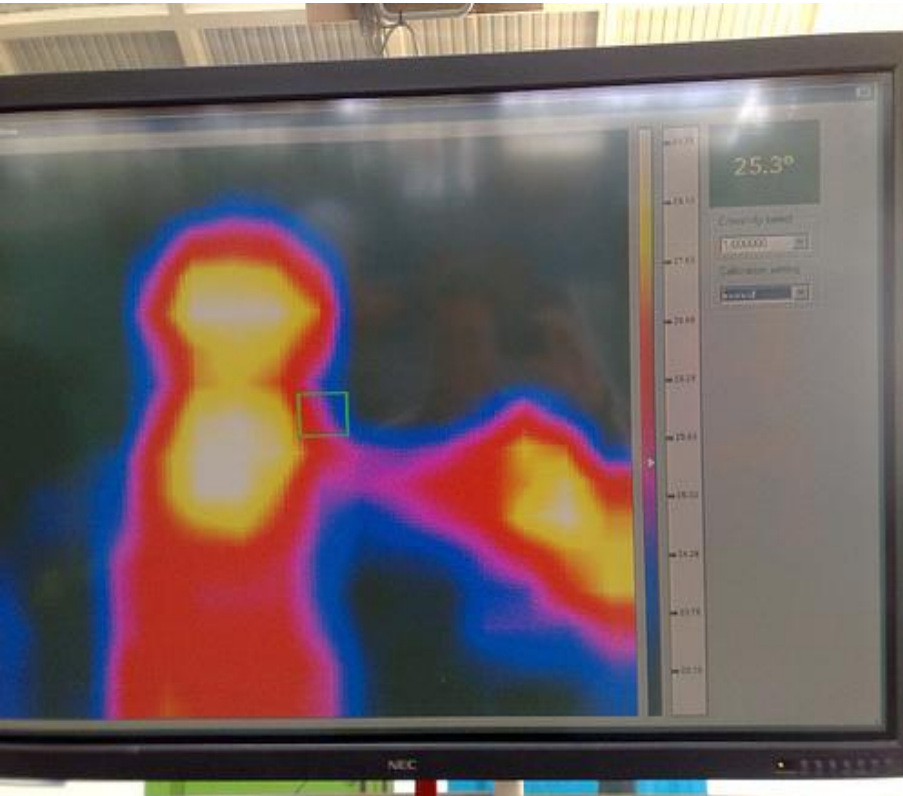




Two types of Predator vision



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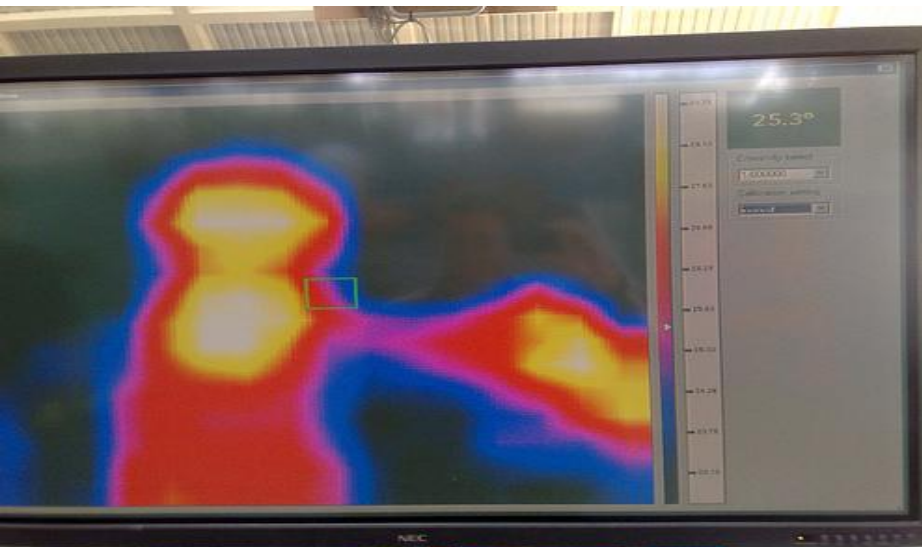
Features: Two types of Predator vision



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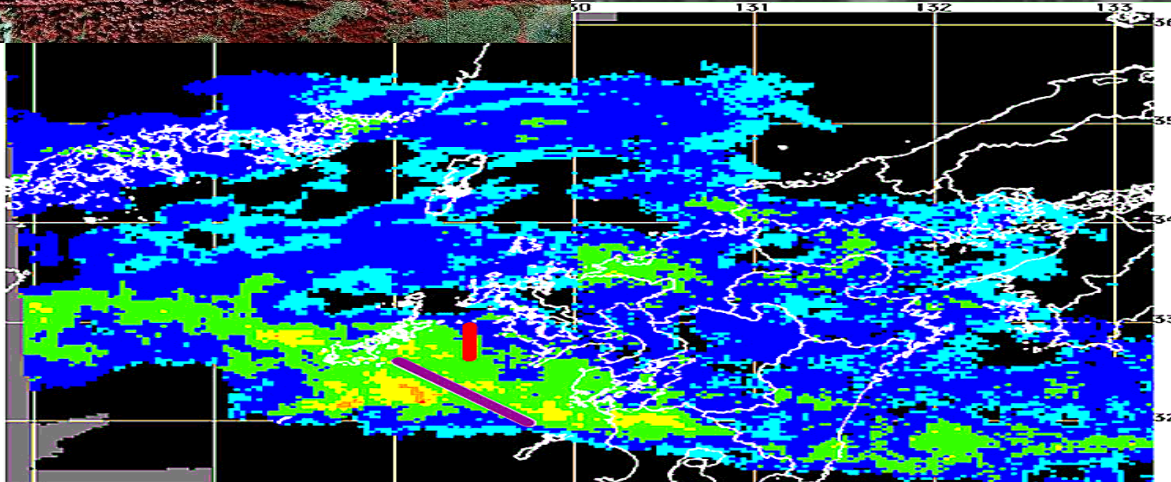
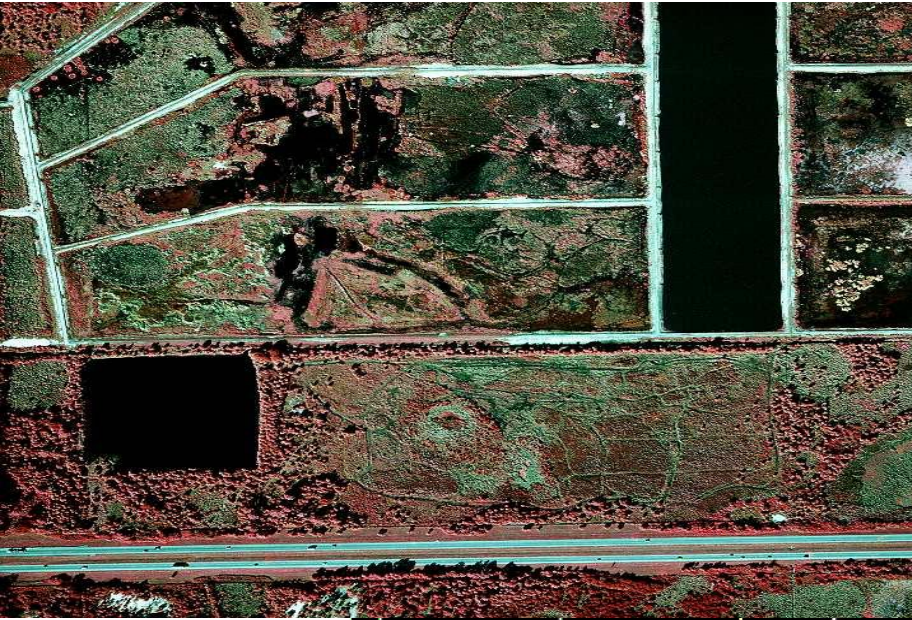
Multi-band
Fused
Integrated
Realistic

Single-band
Separate
Iconic
Realistic & Virtual





Current, separate, vision technologies





Human Factors Challenges:



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High resolution imagery for all systems
needed

The equivalent of Geo-Rectification (pattern matching) of multiple bands
into a cohesive, realistic, single, image.

Selection of intuitive color scheme for band identification

Consideration of auditory input as a diversification and redundant coding
method



Application example



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Challenge

Provide a visual, synthetic system that combines current technology sensors into an integrated visual product, fusing data into a model that is both cognitively intuitive and powerful.



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