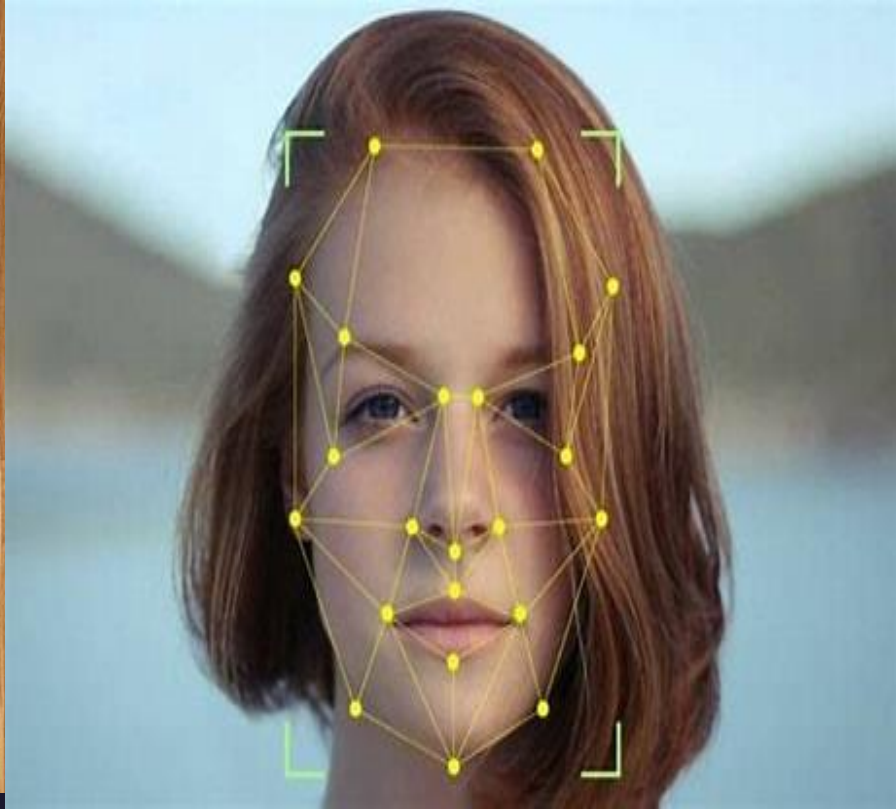# Psychological Evaluation using AI

Problem:

On Long duration space missions the psychological health of the astronauts is a critical issue. Assessing the mood and emotions of the crew member can improve astronaut performance and mission success

Facial Recognition

Using generative AI, determine the current mood of the subject.

REQUIREMENTS FOR SUCCESS

- System should take advantage of on-board imagery
- System should be able to analyze facial expression is variable lighting conditions and from oblique presentation
- System should include a large, suitable library of relevant facial expressions validated to genuinely elicited emotions
- System should maintain subject privacy

Facial Recognition

CONSTRAINTS

- No additional hardware (cameras, etc) should be required to operate system
- Algorithm(s) must be universal in application (trained on range of skin tones) and must be able to negate significant facial hair
- Cephalad fluid shifts must not impact sensitivity or specificity of analysis

Facial Recognition

Voice Recognition

Using generative AI, create an assessment of mood based on Voice sound waves.

REQUIREMENTS FOR SUCCESS

- System must be trained in relevant language(s) and include library of commonly used NASA acronyms
- Ability to filter out cabin background noise
- Pass "spoof-testing" using emphatic contra-intuitive responses

Voice Recognition

CONSTRAINTS

- Must include analysis/testing to confirm verification & validation to prevent incorrect interpretations
- Capability to include acoustic and semantic voice stress pattern recognition
- Detection of and differentiation between behavioral, fatigue-related and toxicologic (elevated cabin CO_2) alterations in speech

Voice Recognition