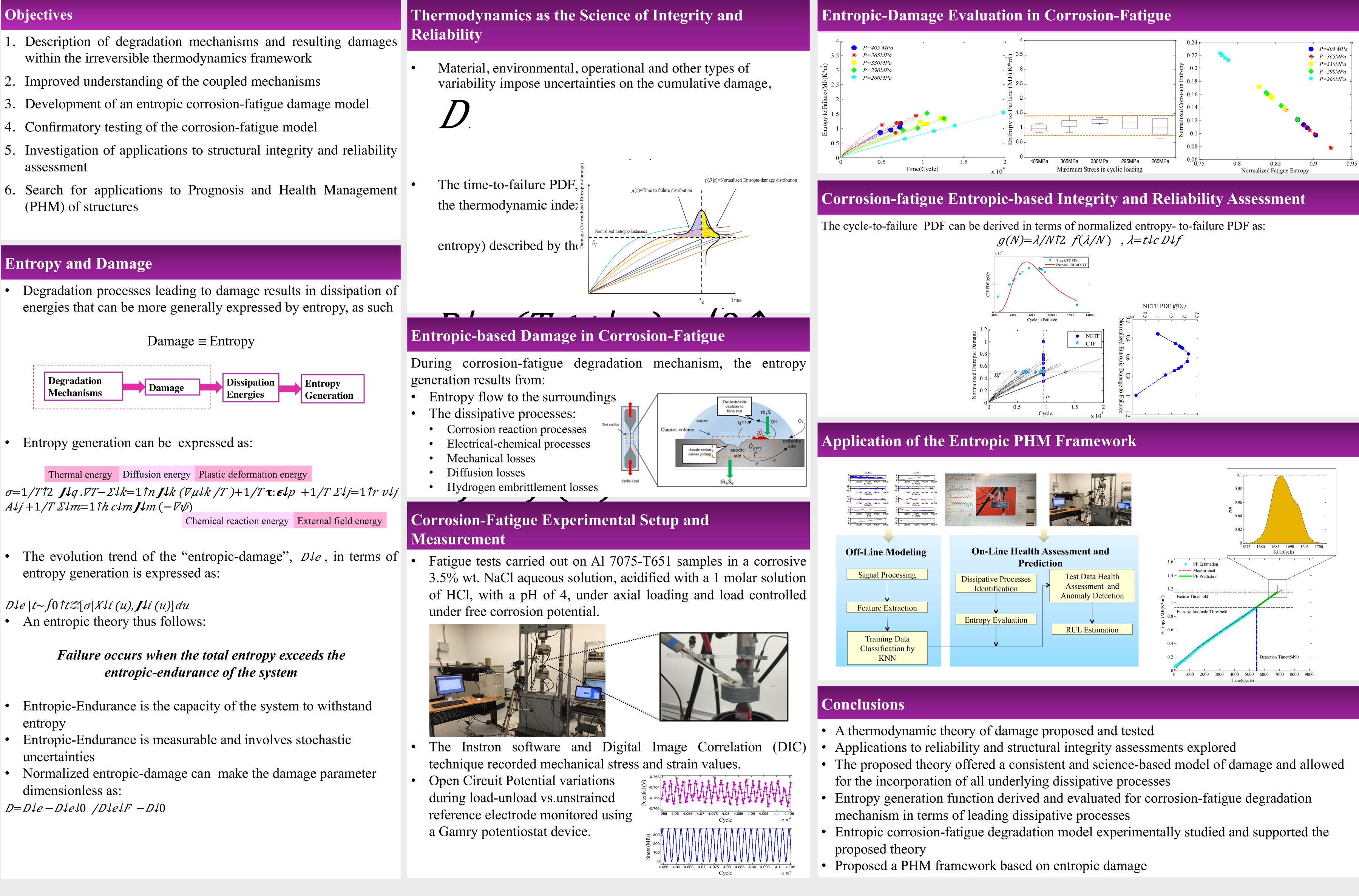
Development of a Generalized Entropic Framework for Damage Assessment

Objectives

- within the irreversible thermodynamics framework
- 2. Improved understanding of the coupled mechanisms
- 3. Development of an entropic corrosion-fatigue damage model
- 4. Confirmatory testing of the corrosion-fatigue model
- assessment
- (PHM) of structures

Entropy and Damage



Entropy generation can be expressed as:

 $A\downarrow j + 1/T \Sigma \downarrow m = 1 \uparrow h c \downarrow m J \downarrow m (-\nabla \psi)$

entropy generation is expressed as:

 $D \downarrow e | t \sim \int 0 \uparrow t = [\sigma | X \downarrow i(u), J \downarrow i(u)] du$

An entropic theory thus follows:

- Entropic-Endurance is the capacity of the system to withstand entropy
- Entropic-Endurance is measurable and involves stochastic uncertainties
- Normalized entropic-damage can make the damage parameter dimensionless as:

 $D = D \downarrow e - D \downarrow e \downarrow 0 / D \downarrow e \downarrow F - D \downarrow 0$

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