

K-Extreme



KARAX

OVERVIEW

K-Extreme Survivability Predictor is a machine-learned approximating engine which provides a conservative approximation of survivability by calculating the minimum damage capacity required to survive single event effects (SEEs). K-Extreme takes into account the available data on different SEE events and use them to predict chance of survival for a new SEE condition. There are multiple standardized conditions for Loss-of-coolant accident (LOCA) in Nuclear reactors, Solar Flares for Space applications, and nuclear detonation simulations for strategic defense applications.



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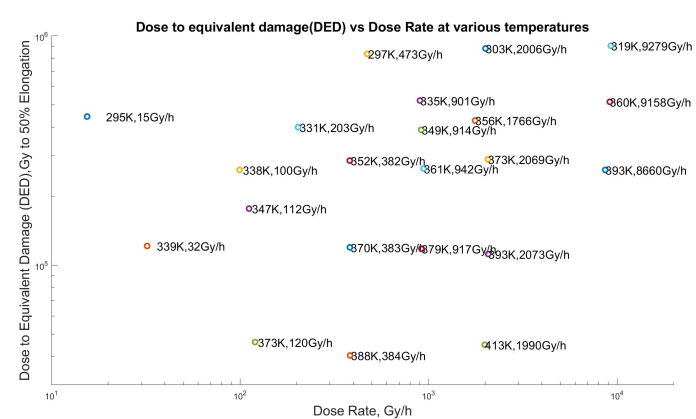
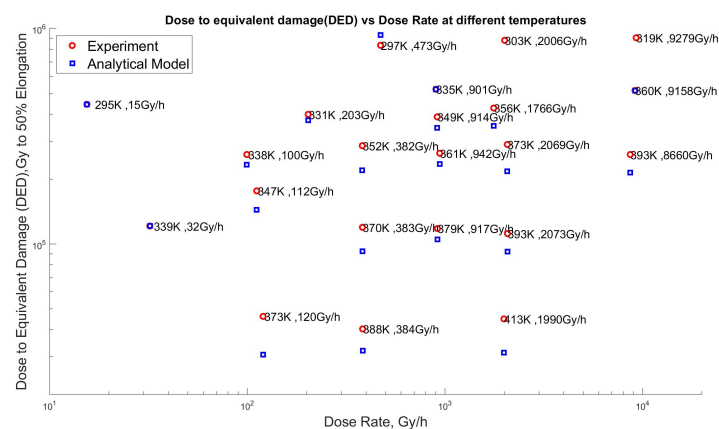
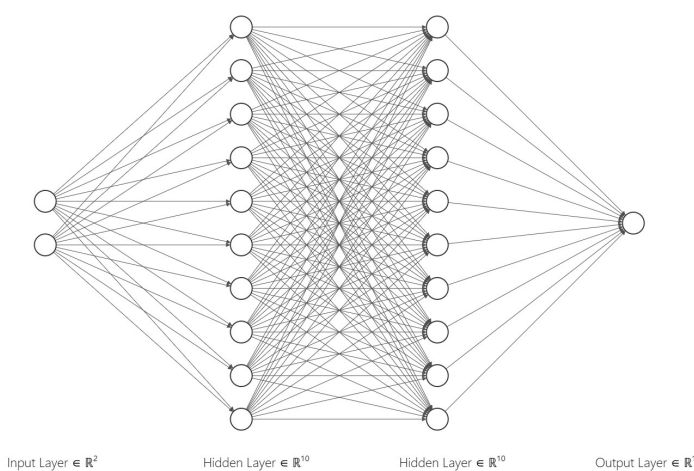
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K-Extreme NN engine is developed based on two main concepts:

1. Constraining the solution space using physio-chemical rules developed in K-Load.
2. Incorporating Imprecise background knowledge through loss functions and prioritizing them over data.



BUSINESS VALUE

- Manufacturers in the inverse design of compounds to survive certain extreme SEE events after a certain time
- Design engineers for mission and condition-specific selection of polymeric materials to survive certain events
- Nuclear Warfare/reactor engineers to optimize inspection, repair, and retirement of polymeric components, e.g. in microelectronics, by having a quantified prediction of the Remaining Useful Life (RUL) of TIMs
- Energy and Defense Regulatory commands by providing the required data to assess the survivability and RUL of the electronics required to support life-extension applications.

CAPABILITIES

Nuclear applications:

- Loss of coolant accident (LOCA)
- Detonations
- Nuclear Warfare/reactors

Space applications:

- Solar flares
- Plasma and radiation bursts