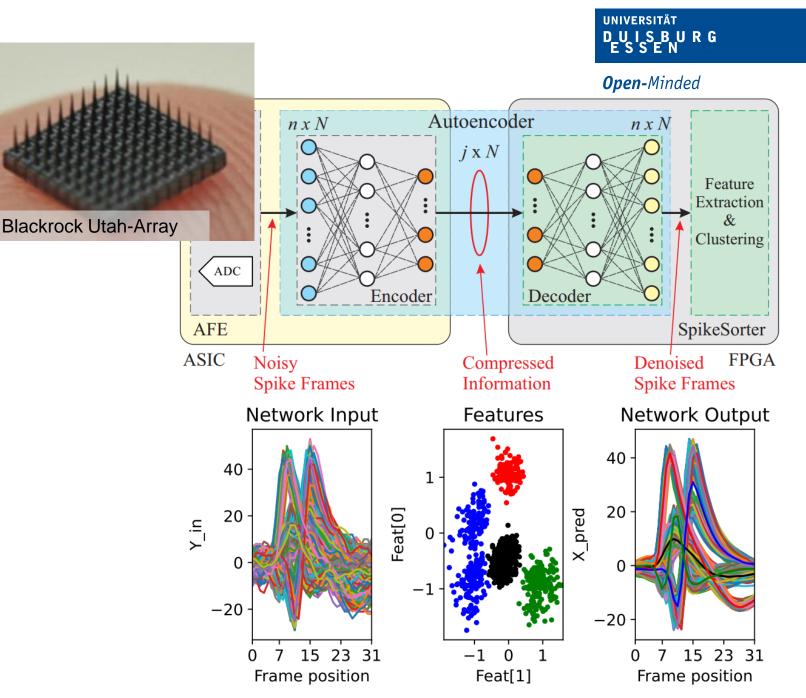
## **Motivation / Application**

- Deploying Deep Learning Accelerators for Neural Pre-Processing into Neural SoC
  - Processing the noisy input
  - Feature extraction with an autoencoder
  - Decoding the task from neural pattern
- End-to-End Training of Autoencoder with Quantization

Loss: MSE

Input: Noisy Spike Frames

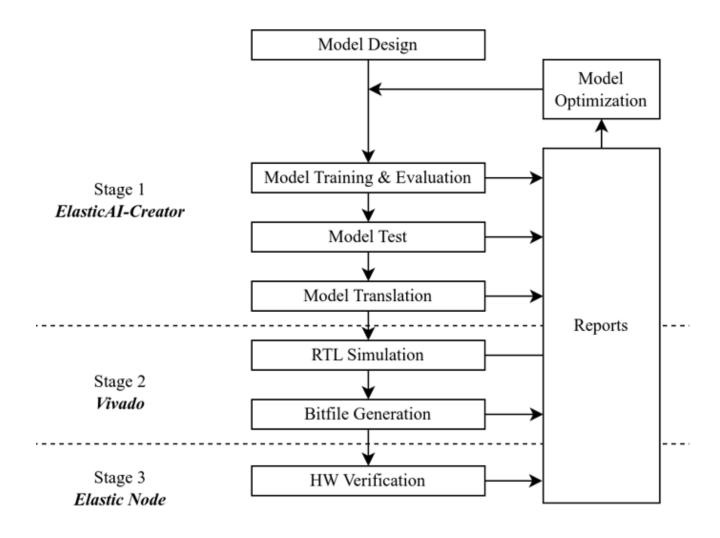
Output: Noisy Spike Frames



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L = Size of input layerj = Size of hidden layerN = Number of electrode channels

## **ElasticAl workflow**



DUISBURG ESSEN **Open-**Minded Wireless + Addon **RP2040 MCU** AMD Spatan-7 **FPGA** 32MByte Flash RAM ∃E.M∃ 8Mbit Flash LP402535 ⚠ Do not disassemble, crush, burn, puncture, damage or drop

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Slide **2** 28.07.2023

[1] Qian et al., "ElasticAl-Creator: Optimizing Neural Networks for Time-Series-Analysis for On-Device Machine Learning in IoT", AlChallengeloT, 2022