WELCOME

CRESCENT
CASCADIA REGION EARTHQUAKE SCIENCE CENTER

MACHINE LEARNING TECHNICAL SHORT COURSE

WHEN
May 12-14, 2025

WHERE
Seattle, WA

Develop AI-aided earthquake catalogs through 3 key steps: event detection, association, and location
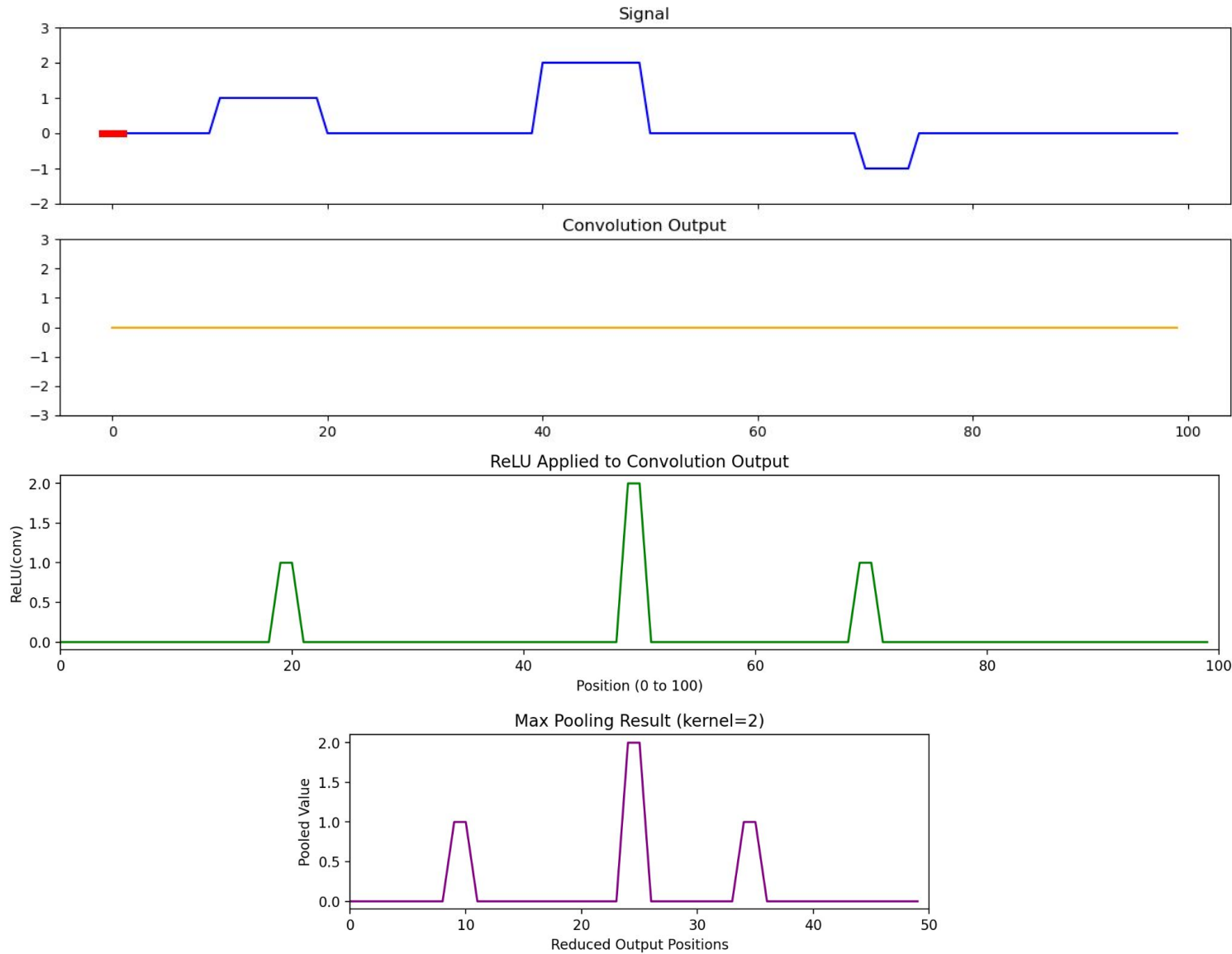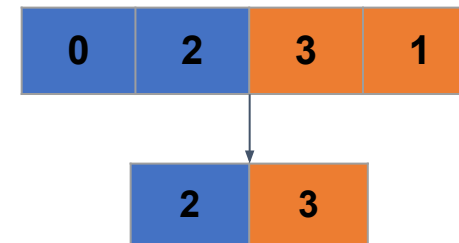
Day 1

Building and training a UNet

https://cascadiaquakes.org
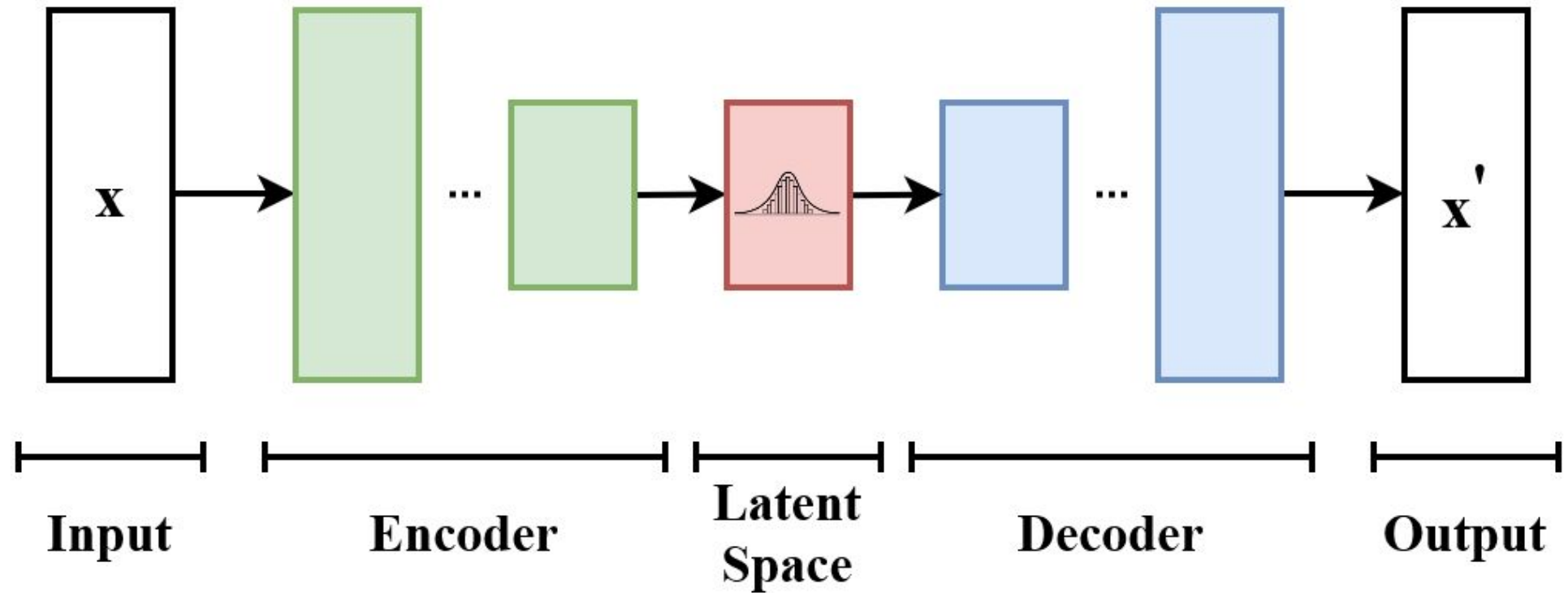
Quick view of CNN

Signal

Convolution Output

ReLU Applied to Convolution Output

Max Pooling Result (kernel=2)

Kernel: 1, 0, -1

$ReLU(x) = max(0, x)$

0	2	3	1

2	3

Autoencoder

Input   Encoder   Latent Space   Decoder   Output

UNet
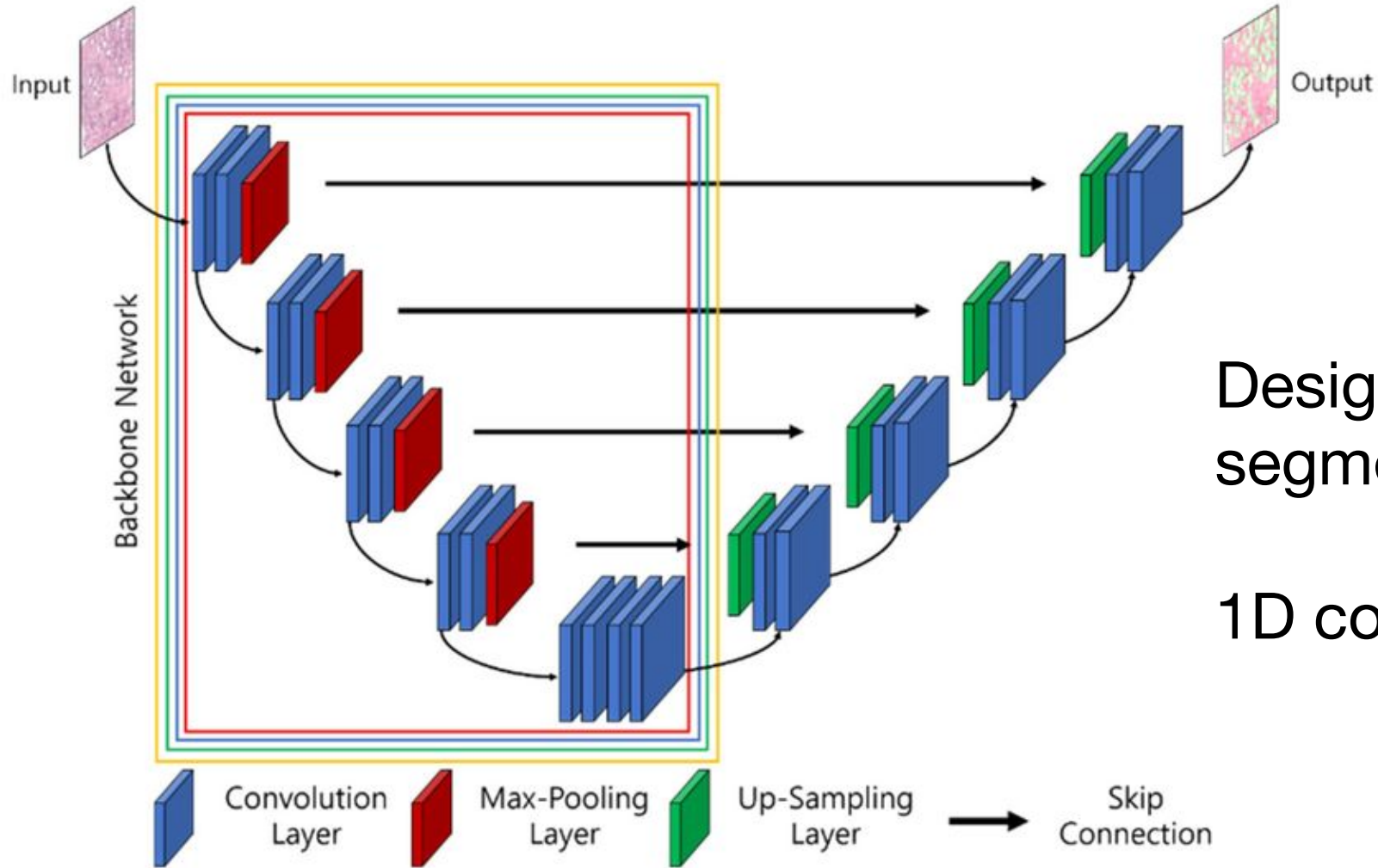
Designed for image segmentation with 2D conv

1D conv → 1D segmentation

Ikromjanov, Kobiljon et al. (2023). Region Segmentation of Whole-Slide Images for Analyzing Histological Differentiation of Prostate Adenocarcinoma Using Ensemble EfficientNetB2 U-Net with Transfer Learning Mechanism. Cancers. 15. 762. 10.3390/cancers15030762.