

Enhancing Robustness

BSM Parameter Inference with n1D-CNN and Novel Data Augmentation

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Keywords:

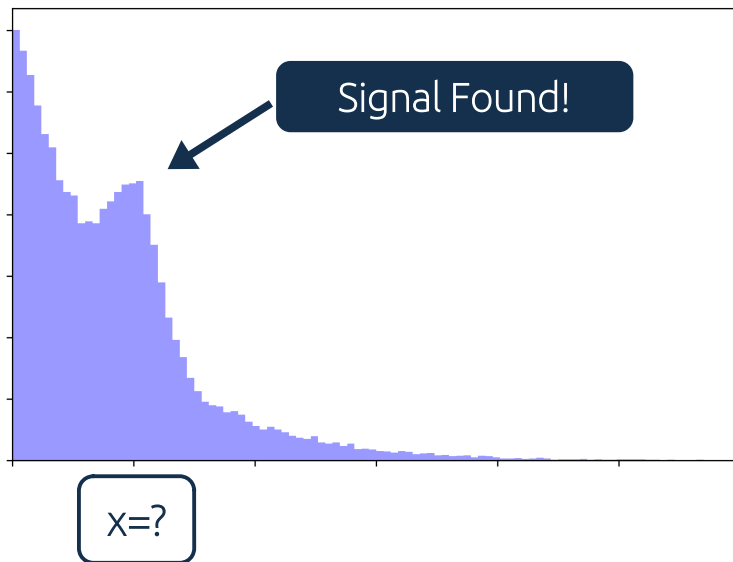
- Parameter Inference
- Improving CNNs
- Data Augmentation
- Signal Region Evaluation



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Poster
A:14

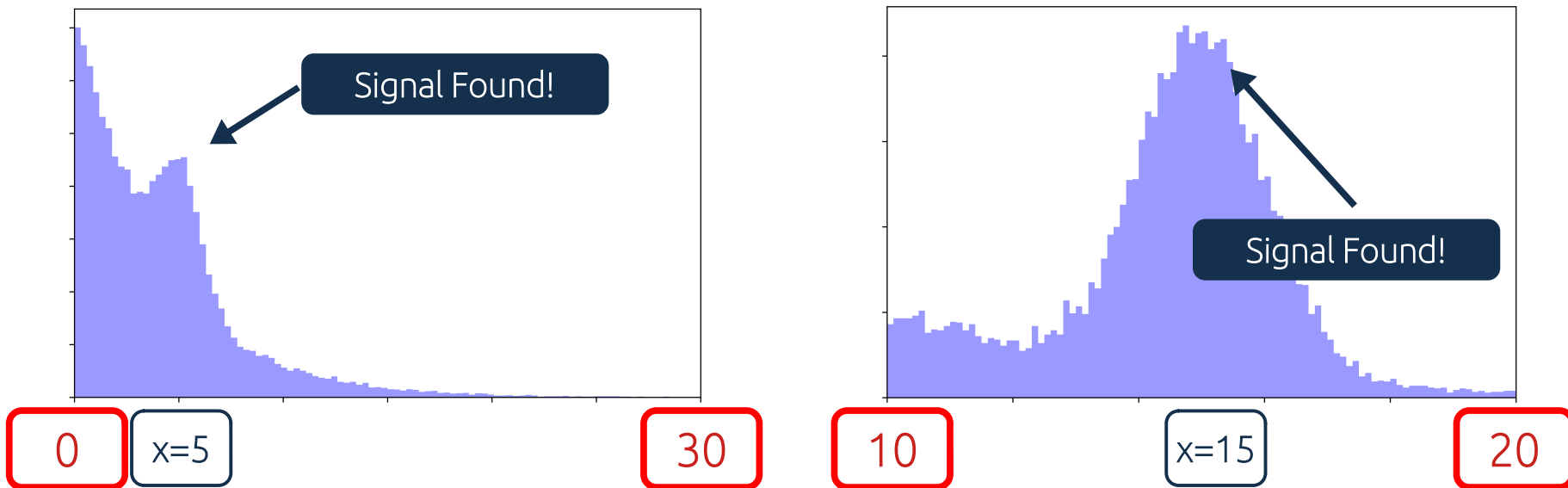
Given the following images, what is x_{signal} ?



Impossible! No scale of reference!
Recall CNN can only see images/pixels

(Convolutional Neural Network)

Auxiliary Information Important !



CNNs need **Aux Info** to infer from Different Signal Regions



n-1DCNN-wA

(Extending 1DCNN with Auxiliary Inputs)

BSM Inference

(Beyond Standard Model)

from

ANY SIGNAL REGION

ANY FIXED NO. OF OBSERVABLES

Poster A:14

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BUMP HUNTS

1 Observable

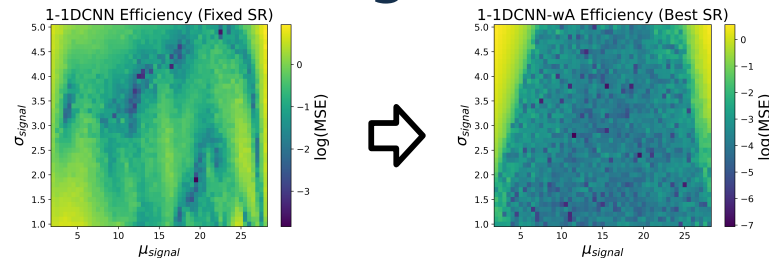
BUMP-LESS MONO-X SIGNALS

(Dark Matter Search)

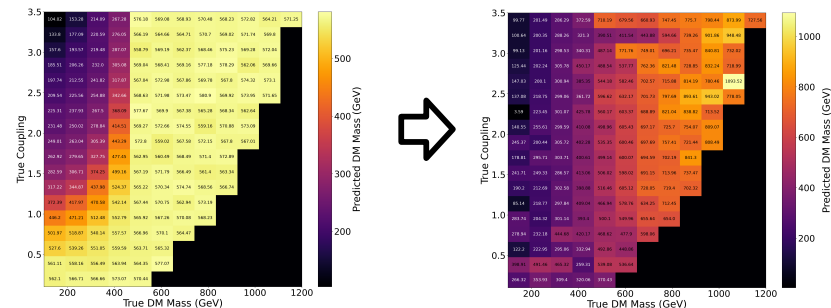
3 Observables
(and more with Mono-Z)

BONUS ADVANTAGES

Orders of Magnitude Better



Expands Infer-able Parameters Space



Data Augmentation

(that grows with $N_{\text{Signal Region}}$ and $N_{\text{Observables}}$)

+

Signal Region Evaluator

(Which is the Best Signal Region?)