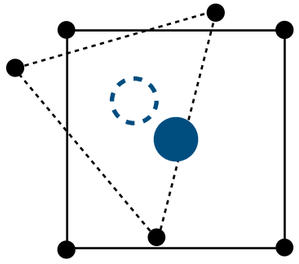
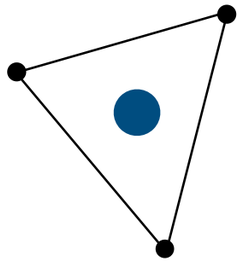
CFD-specific Issues

Valid Approaches to a single data problem



Interpolation

Perform interpolation from unstructured to structured, applying CNNs or UNets, then performing backwards interpolation



Work on unstructured

Take advantage of GNNs, working on a Graph-structured data

- **Point-wise approach**
  - Act as-if there is no mesh w/ MLPs or CloudNets,
  - therefore losing spatial correlations

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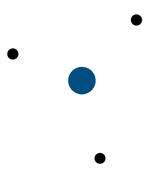
CFD-specific Issues

Valid Approaches to a single data problem



Point-wise approach

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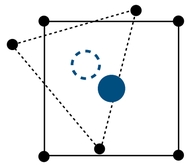

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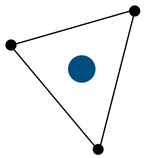
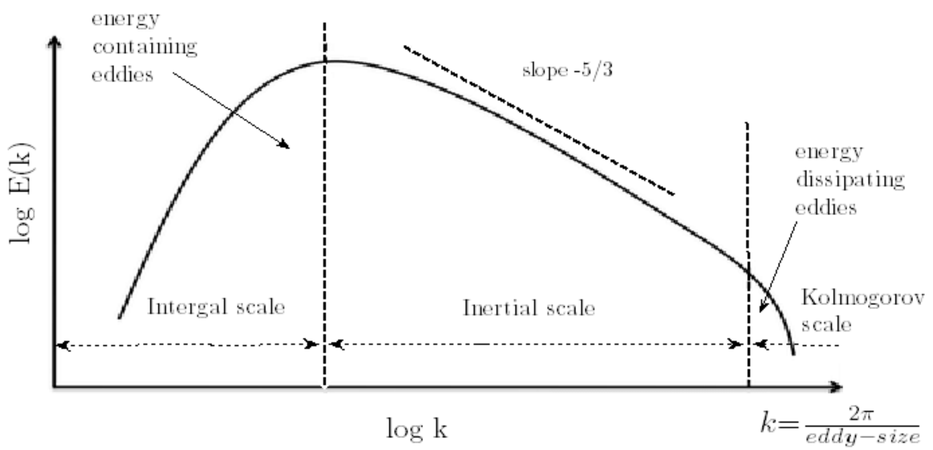


Work on unstructured

Take advantage of GNNs, working on a Graph-structured data

CFD-specific Issues

Physics-related incoherences, instabilities



- Check coherence with Energy Spectrums, Divergence, Metrics
- Incorporate Physics loosely w/ PINNs, tightly w/ FNOs
- Improving coherence w/ optimal transport Loss Function (Wasserstein)

https://www.researchgate.net/figure/Sketch-of-Kolmogorov-energy-spectrum-for-all-turbulent-flows_fig1_319321160