Modeling multi rack Ultrafiltration Using Physics-informed Neural Networks (PINN)

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1: Introduction

The Problem

Upscaling a multiproduct plant is challenging using traditional mechanistic models due to varying product parameters.

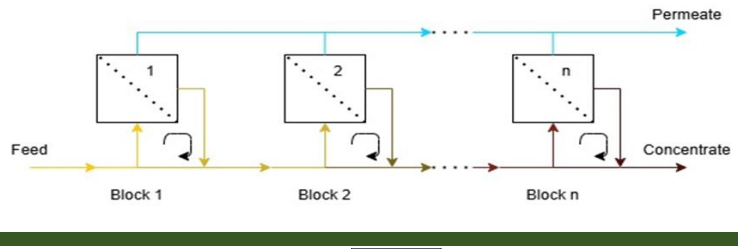
The Consequences

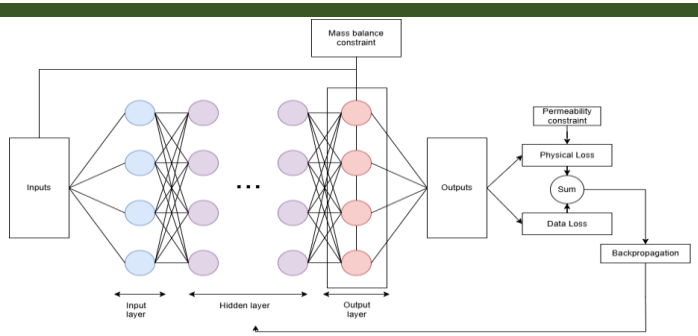
For an ultrafiltration model, this can lead to model inaccuracy and a lack of flexibility, combined with low interpretability.

The Solution

Therefore, we evaluate using PINN in this project, as it allows the model to consider physical laws, thereby improving robustness.

2: Methods





4: Perspectives

Helix Lab Fellow

- A chance to meet new people.
- Provide a huge amount of resources.
- Help to get to know Kalundborg

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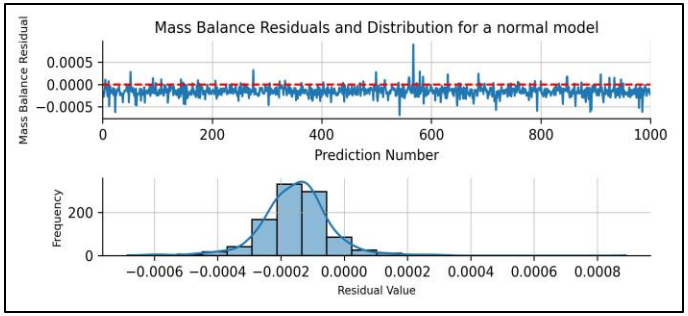
- Provide resources and great support.
- Offered a chance to experience the work culture.

3: Results



Normal Model	Mean Specs	PINN Model
0.983	R^2	0.986
$-1.53*10^{-4}$	Residual for MB	$-1.4*10^{-8}$
0.00521	MAE	0.00467
0.00696	RMSE	0.00648

*Note all stats are based upon scaled data