Identification of model parameters and metrics

PhD course, 22/04/2020

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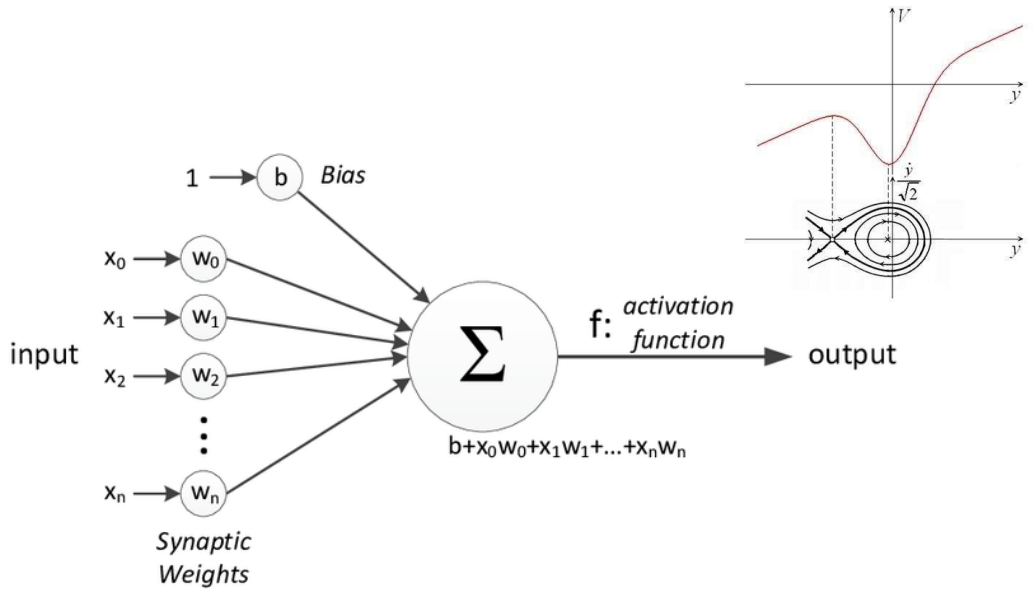
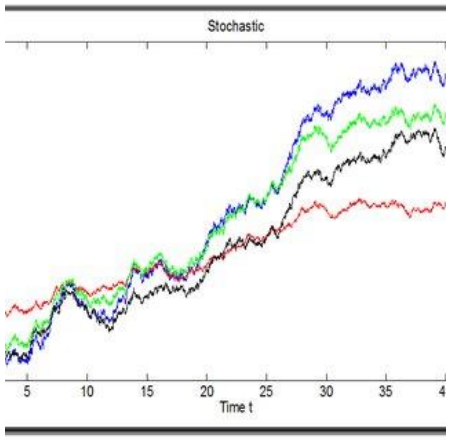
What is a model?



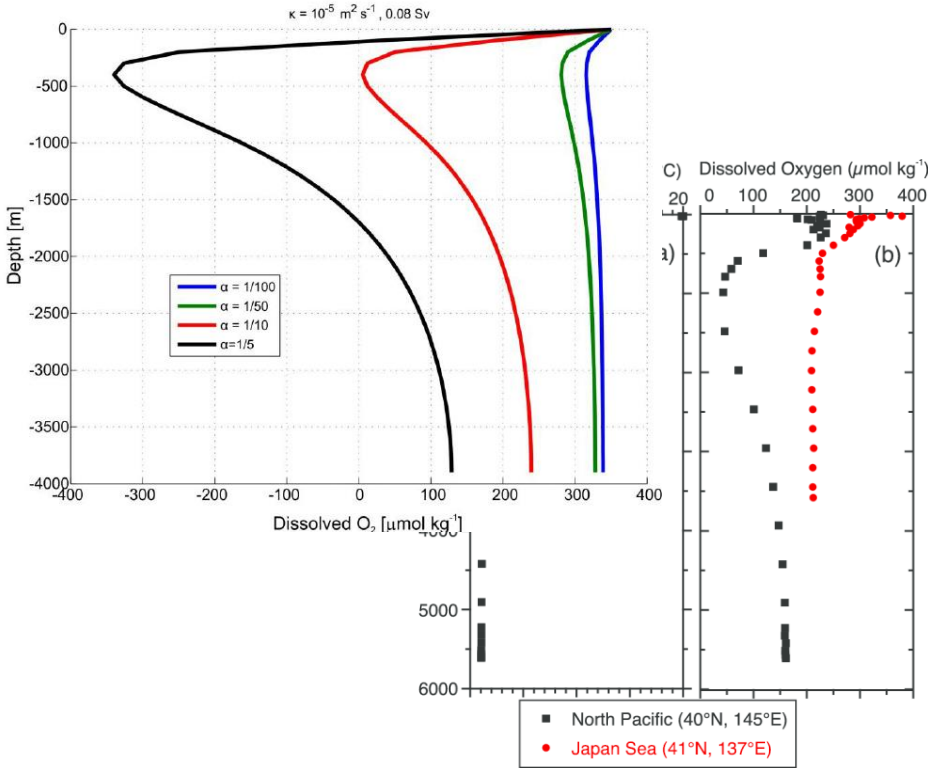
A mathematical model can be defined as a description of a system using mathematical concepts and language to facilitate proper explanation of a system or to study the effects of different components and to make predictions on patterns of behaviour (Abramowitz and Stegun, 1968)

Which kind of models?

Stochastic model
(probability functions)
e.g. Finance

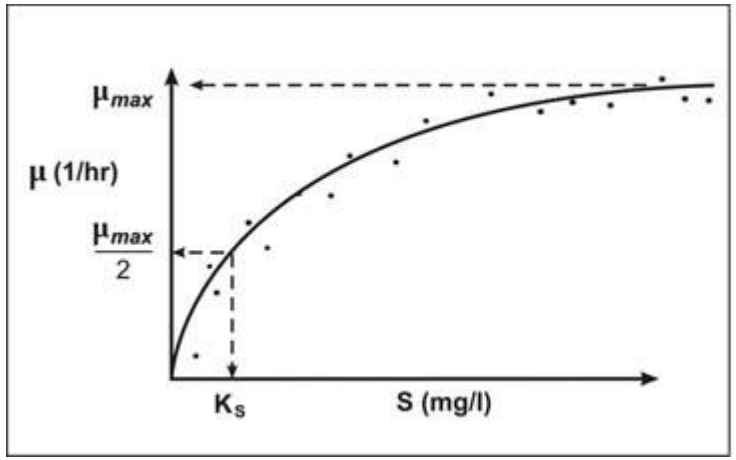


Empirical model
e.g. data comparison,
physic phenomena simplification

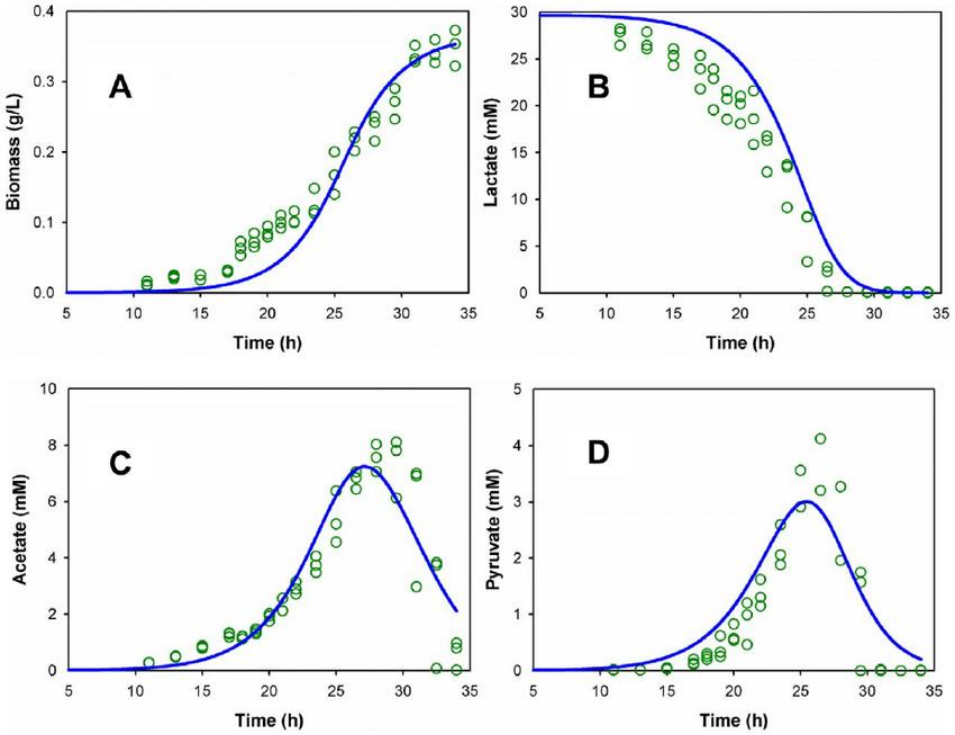


Mechanistic model
e.g. (bio)Kinetic model,
chemical reactions,
bacterial growth

What is a (bio)kineticmodel?

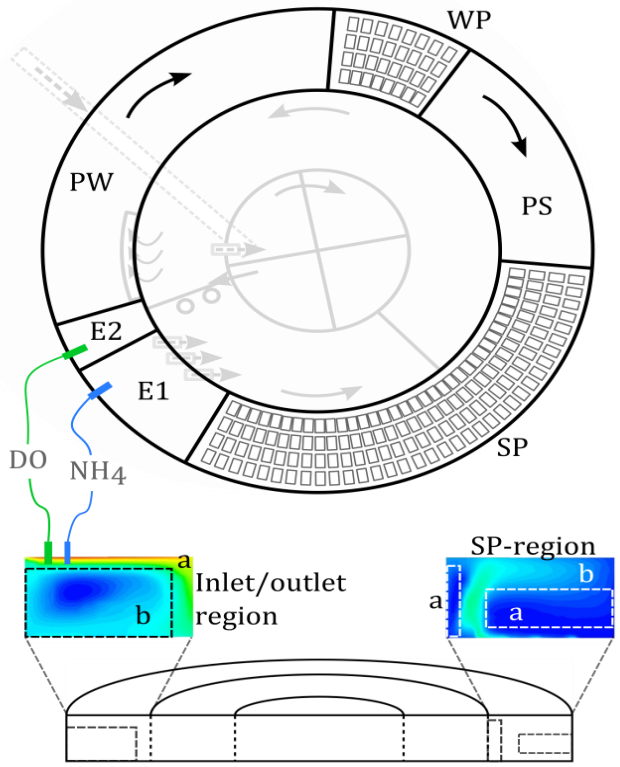


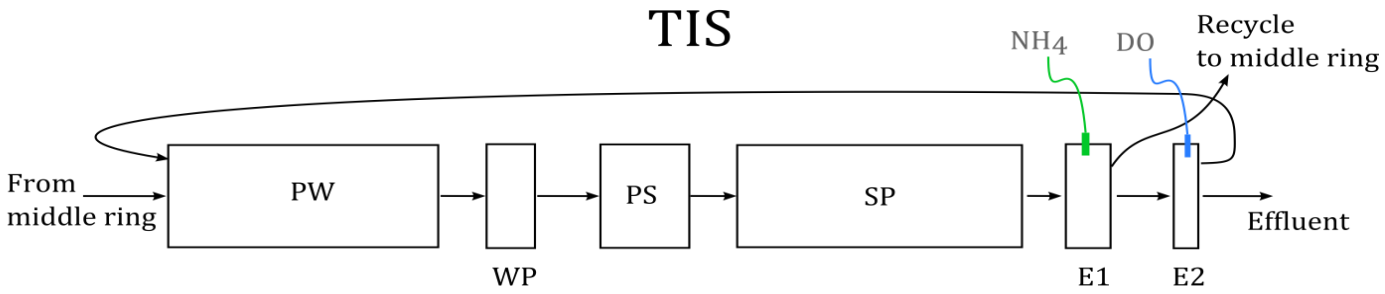
$$\mu = \mu_{max}\left(\frac{S}{S+K_S}\right) \quad (5)$$

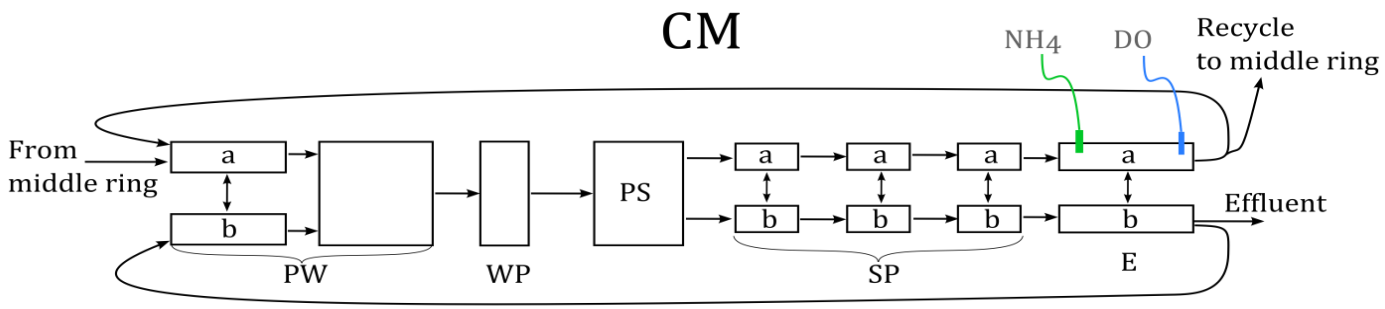


Important definition
Parameter - Variable

Comparison of model layouts







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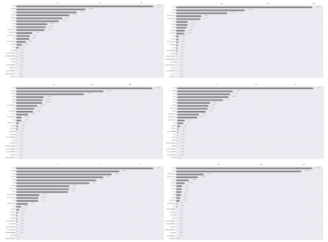
A framework for model performance comparison

GSA
LH-OAT



N combinations x k parameters

Nxm Metrics

For each I = 1:N

[cores x k]

[1xkxV]

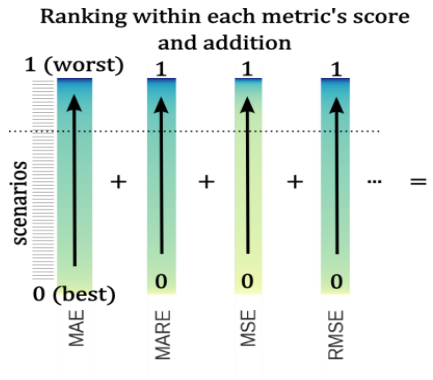
pyWEST

simulations

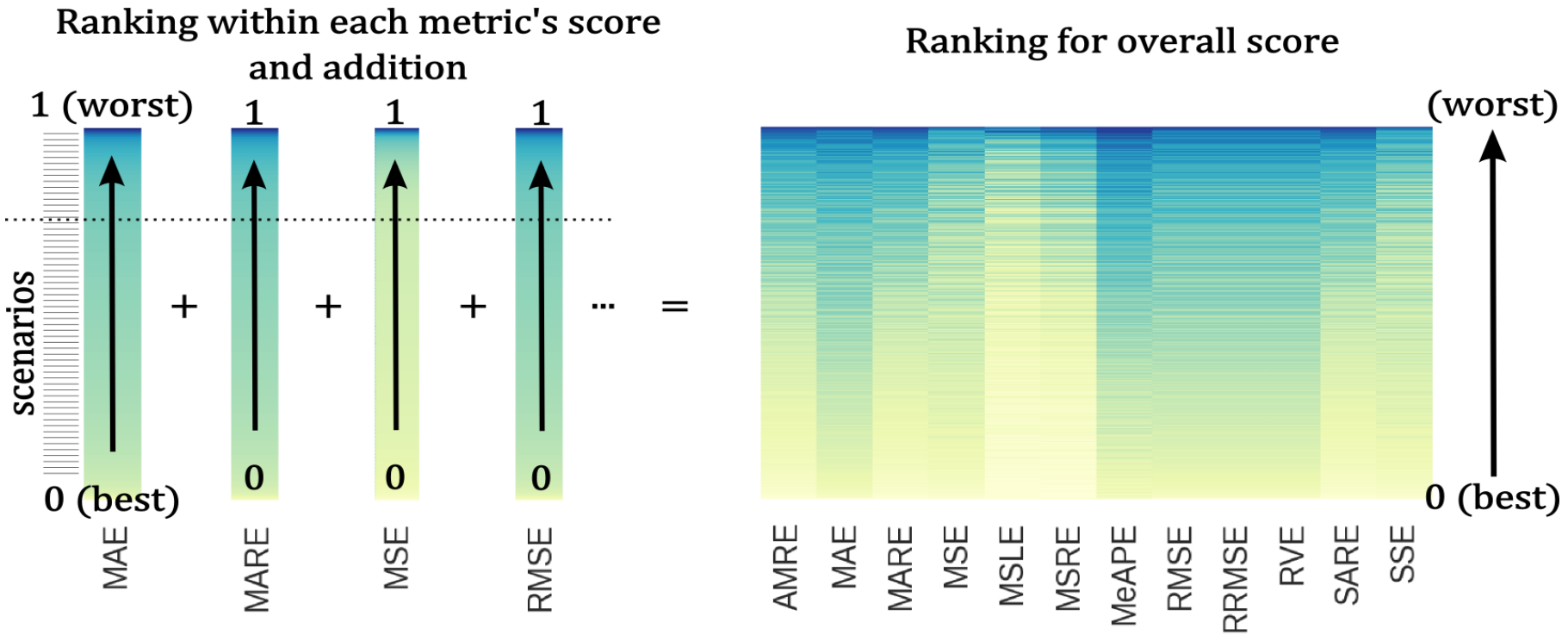
Tornado

output

Metrics



Evaluate and compare scenario performance



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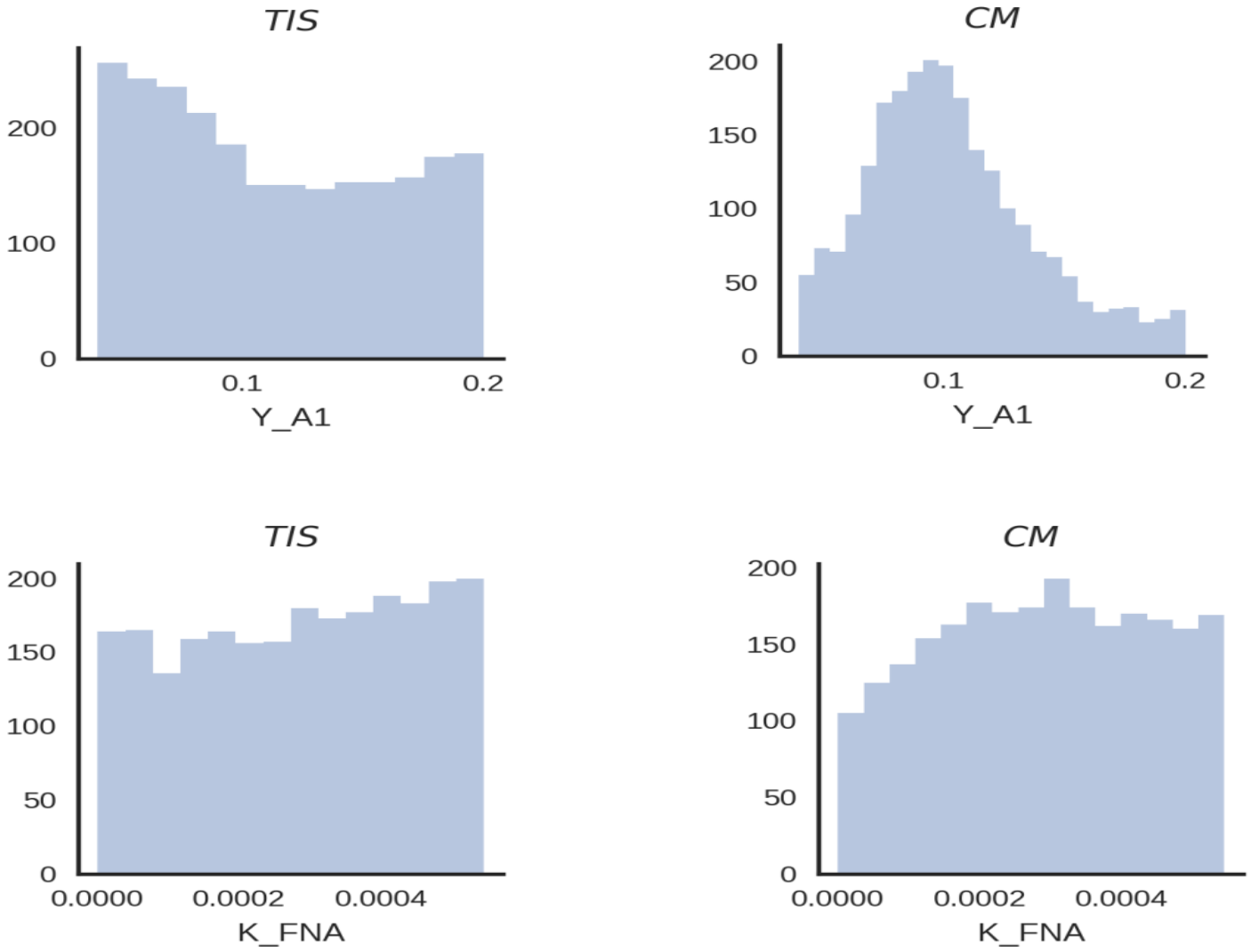
Fair scenario performance evaluation



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