



Delft University of Technology

Document Version

Final published version

Citation (APA)

Singh, D., Dwight, R. P., & Viré, A. C. (2022). *Probabilistic surrogates for floating wind-turbine load emulation*. Poster session presented at 2022 PhD Academic Event, Delft, Netherlands.

Important note

To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright

In case the licence states "Dutch Copyright Act (Article 25fa)", this publication was made available Green Open Access via the TU Delft Institutional Repository pursuant to Dutch Copyright Act (Article 25fa, the Taverne amendment). This provision does not affect copyright ownership.
Unless copyright is transferred by contract or statute, it remains with the copyright holder.

Sharing and reuse

Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy

Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

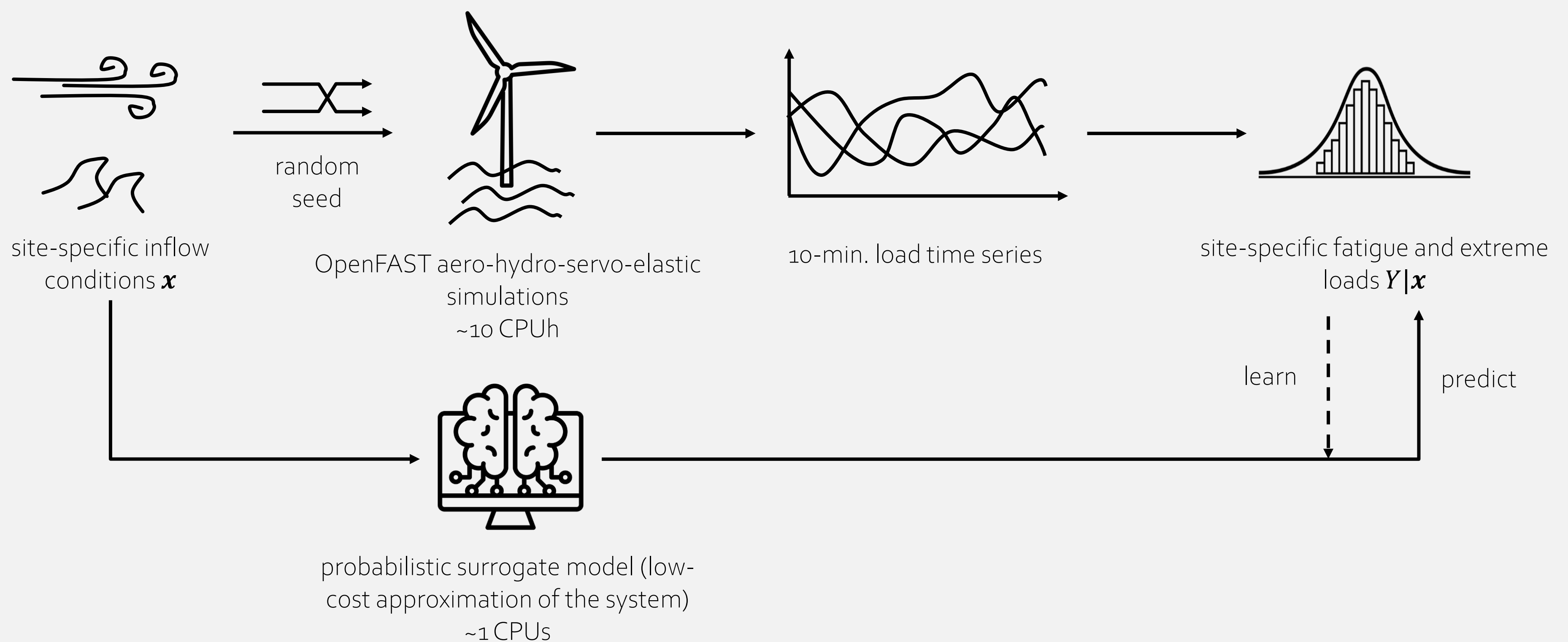
This work is downloaded from Delft University of Technology.

Probabilistic surrogates for floating wind-turbine load emulation

Deepali Singh
AWEP
Wind Energy
Dr. Richard P. Dwight
Dr. Axelle Vire
d.singh-1@tudelft.nl

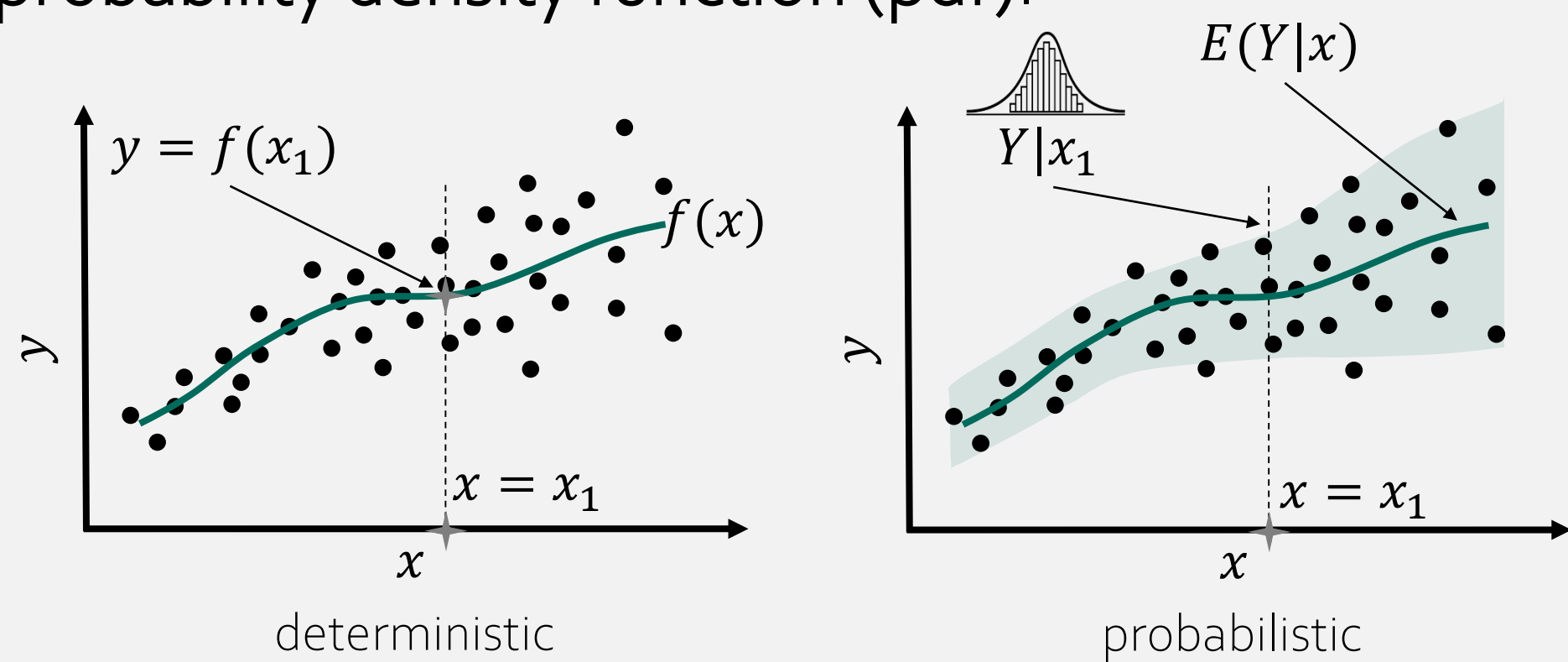


OUTLINE

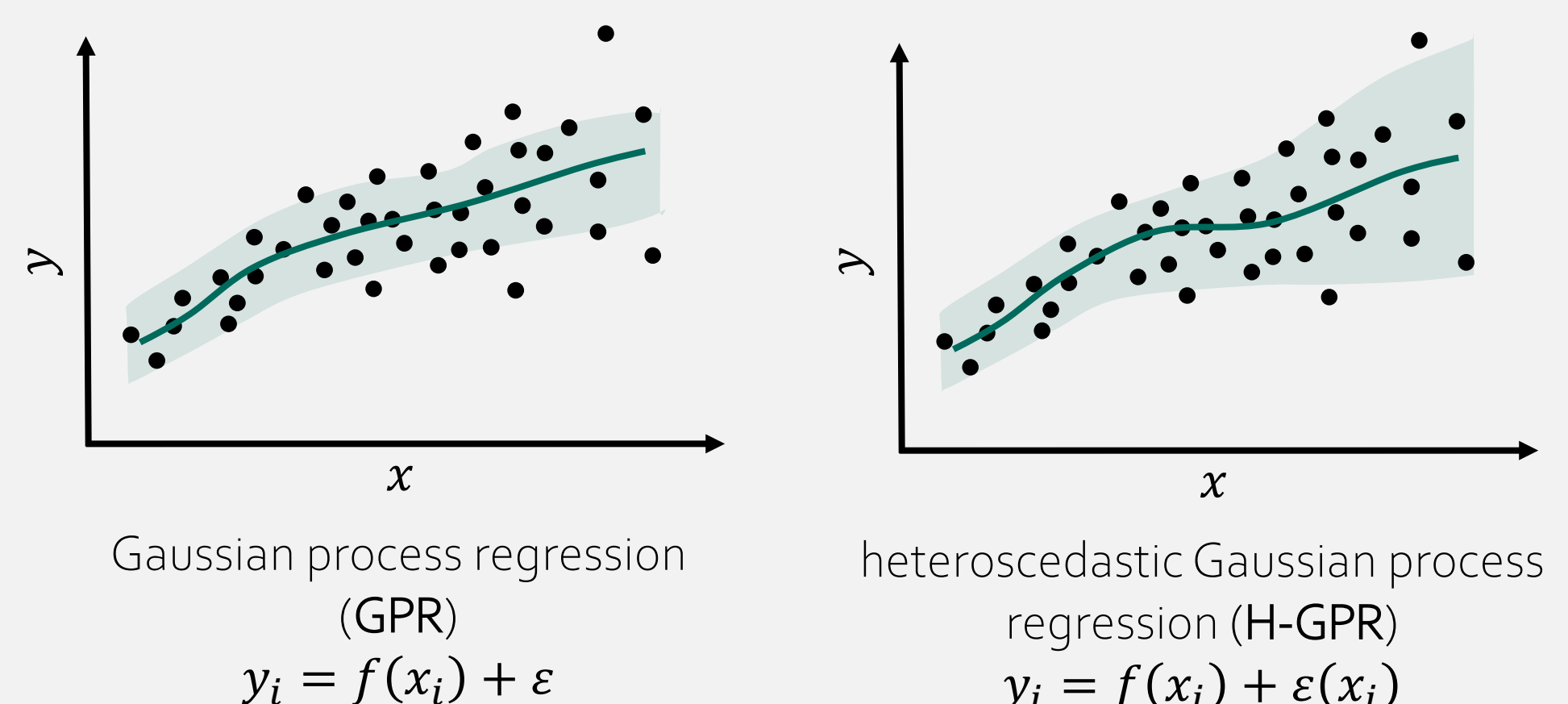


APPROACH

In measurements and in simulations, the wind turbine is subject to **randomly varying inflow conditions**. For a set of mean inflow conditions x , the loads are not deterministic, but random variables of unknown probability density function (pdf).



MODELS



Bayesian statistical methods like the heteroscedastic Gaussian process regression can directly infer the underlying mean and variance of the pdf from a noisy database.

RESULTS

The predicted conditional pdf at specific values of x for a **fixed-bottom offshore wind turbine** are shown. H-GPR shows a **very good agreement with the full order model** and a significant improvement over the more commonly used GPR model. The work is currently being extended to floating wind turbines.

