Part I: Theory of LoFT

To be released soon.

Part II: Community Tools for Floating Wind Turbines

LoFT (**L**ow-**O**rder modelling of floating wind turbines **F**or **T**raining) draws on the work of other open-source repositories. Below we give a list of them and collect their links and key features. Hope that this list will help beginners and developers.

Table1. A list of open-source repositories for beginners in the area of floating wind turbines

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| --- | --- | --- | --- |
| Repository(link) | Key features | Main Purpose | Developers |
| [OpenFast/Fast.Farm](https://github.com/OpenFAST) | Individual turbine or wind-farm model (with a limited number of wind turbines) written in Fortran; can simulate steady or turbulent inflow, regular or irregular waves; and conduct structural/fatigue analysis. The resulted are validated by scaled experiments. | Modelling | NREL |
| [WEC-Sim](https://github.com/WEC-Sim) | Wave Energy Converter Simulator (WEC-Sim), an open-source code for simulating wave energy converters. The code implementations for hydrodynamics and mooring dynamics are similar and helpful for modelling of floating wind turbines. | Modelling | NREL |
| RAFT | RAFT - Response Amplitudes of Floating Turbines, python codes for frequency-domain analysis of floating wind turbines. It presents a design-oriented modelling of floating wind turbines | Design | NREL |
| WISDEM | The Wind-Plant Integrated System Design and Engineering Model (WISDEM) is a set of models for assessing overall wind plant cost of energy (COE). Helpful for design and economic assessment of floating wind turbines | Design | NREL |
| ROSCO | Reference open-source controller that can be used in OpenFAST; when compiled, produces a libdiscon.so controller that uses a specified DISCON.IN file. The controller for floating wind turbines features floating feedback, peak saturation and detuned natural frequency. | Control | CU Boulder  /NREL |
| [Floris](https://github.com/NREL/floris) | FLORIS is a controls-focused wind farm simulation software incorporating steady-state engineering wake models into a performance-focused Python framework. | Control | NREL |
| [MoorPy](https://github.com/NREL/MoorPy) | MoorPy is a design-oriented mooring system library for Python based around a quasi-static modeling approach. | Design | NREL |
| [HydroChrono](https://github.com/NREL/HydroChrono) | HydroChrono is an emerging hydrodynamics simulation tool designed to model complex ocean systems. Seamlessly integrated with the Project Chrono physics engine, it offers a powerful C++ API for a wide range of simulations. | Modelling | NREL |
| QBlade | Built on the Project Chrono physics engine. | Modelling |  |
| MOST (link1, link2) |  | Modelling | MOREnergyLab |
| [TurboPark](https://github.com/OrstedRD/TurbOPark) | The TurbOPark wake model has been developed by Ørsted and was validated on 19 offshore wind farms coupled with a blockage and a flow model. | Control | DTU |
| [LoFT](https://github.com/yangmingmei/LoFT) | Low-order modelling of floating wind turbines for reinforcement learning training. | Control | XJTU |

Part III: Open-source Data Base for Floating Wind Turbines

To be released soon