任政儒 (Zhengru Ren)

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工作经历

2019.8 – 至今 博士后研究员，海洋技术学院，挪威科技大学 特隆赫姆, 挪威
Centre for Research-based Innovation of Marine Operations (SFI MOVE)
- 课题: 智能海洋工程舰载决策支持系统（基于船体运动的波浪谱估计及船体模型修正）

2019.4 – 2019.8 研究员, 海洋操作与土木工程学院, 挪威科技大学 奥勒松, 挪威
- 课题: 漂浮式风机一体化安装数值模拟与自动控制

教育背景

2016.1 – 2019.8 **博士**，挪威科技大学 特隆赫姆, 挪威
Centre for Research-based Innovation of Marine Operations (SFI MOVE)
Centre for Autonomous Marine Operations and Systems (NTNU AMOS)
专业: 海洋技术
- 论文题目: 固定式及漂浮式海上风机的自动安装及决策支持系统
- 主导师: Roger Skjetne, 副导师: Zhen Gao

2013.8 – 2015.6 **硕士**，挪威科技大学, 特隆赫姆, 挪威
专业: 海洋技术（海洋控制学方向）
- 论文题目: 推进器辅助系泊定位系统的容错控制
- 导师: Roger Skjetne

2008.9 – 2012.6 **工学学士**，大连理工大学 大连, 中国
专业: 船舶与海洋工程
- 论文题目: 19000DWT 成品油轮设计

科研兴趣

智能海洋工程、海上作业、海上风电、数字化技术、数字化孪生、非线性控制理论、传感器融合、系统辨识、海况估计、多智体系统

教学经历

MR8500 - PhD Topics in Marine Control Systems, 挪威科技大学, 2020
课程: Backstepping design on complex nonlinear systems.

指导学生

担任副导师指导博士生

Behfar Ataei, 2019.8–2022.6, Virtual prototyping of installation of offshore power systems.

担任副导师指导硕士生

Sindre Sagsveen Slåttum, 2020.8–2021.6, Load and sea state estimation based on distributed IMUs.

Yuxuan Cai, 2020.8–2021.6, Data-driven condition monitoring of marine battery energy storage systems.

Jens Nikolai Alfsen, 2019.8–2020.6, Dynamic optimal path-planning for autonomous harbor maneuvering.

Caroline Sophie Røhm Fleischer, 2019.8–2020.6, Optimal path-planning on a bio-inspired neural network landscape model for autonomous surface vessels.

Hongyu Zhou, 2019.8–2020.6, Autonomous guidance, stepwise path planning, and path-following control with anti-collision for autonomous marine robots.

Elias Gauslaa, 2019.8–2020.6, Navigation, guidance, and control for autonomous autodocking of ships.

Jakob Stensvik Jensen, 2019.8–2020.6, Dynamic optimal path-planning for autonomous harbor maneuvering.

Baiheng Wu, 2018.4–2019.1, Image processing and target tracking technology in the sea cucumber fishing application.

学术经历

主要科研项目

2022 – 国家自然科学基金优秀青年科学基金项目（海外）项目，获得者

2015 – 2022 挪威研究创新中心计划，舰载决策支持系统，主要执行人

2015 – 2022 挪威研究创新中心计划，海上风机安装，主要执行人

2017 – 2020 上海交通大学海洋工程国家重点实验室开放课题, 海上风机新型安装技术研究, 第二完成人

2018 – 2020 大连理工大学海岸和近海工程国家重点实验室开放课题, 被动式阻尼器对海上风机结构响应的影响, 第二完成人

科研成果

SCI 期刊

[1] Xingji Yu*, Kristian Stenerud Skeie, Michael Dahl Knudsen, **Zhengru Ren**, Lars Imsland, and Laurent Georges. Influence of data pre-processing and sensor dynamics on grey-box models for space-heating: Analysis using field measurements. *Building and Environment*, page 108832, 2022. In press, [中科院小类一区 Top, 影响因子:6.456].

[2] **Zhengru Ren**, Amrit Shankar Verma, Ye Li*, Julie J.E. Teuwen, and Zhiyu Jiang. Offshore wind turbine operations and maintenance: A state-of-the-art review. *Renewable & Sustainable Energy Reviews*, 144:110886, 2021. [中科院小类一区 Top, 影响因子:14.982].

[3] **Zhengru Ren**, Amrit Verma*, Behfar Ataei, Karl Henning Halse, and Hans Petter Hildre. Model-free anti-swing control of complex-shaped payload with offshore floating cranes and a large number of lift wires. *Ocean Engineering*, 228:108868, 2021. [中科院小类一区 Top, 影响因子:3.795].

[4] **Zhengru Ren***, Xu Han, Amrit Shankar Verma, Johann Alexander Dirdal, and Roger Skjetne. Sea state estimation based on vessel motion responses: improved smoothness and robustness using Bézier surface and L1 optimization. *Marine Structures*, 76:102904, 2021. [中科院小类一区 Top, 影响因子:3.458].

[5] **Zhengru Ren***, Roger Skjetne, Amrit Shankar Verma, Zhiyu Jiang, Zhen Gao, and Karl Henning Halse. Active heave compensation of floating wind turbine installation using a catamaran construction vessel. *Marine Structures*, 75:102868, 2021. **ESI highly-cited paper** [中科院小类一区 Top, 影响因子:3.458].

[6] Xu Han*, **Zhengru Ren**, Bernt Johan Leira, and Svein Sævik. Adaptive identification of lowpass filter cutoff frequency for online vessel model tuning. *Ocean Engineering*, 236:109483, 2021. [中科院小类一区 Top, 影响因子:3.795].

[7] Xu Han*, Bernt Johan Leira, Svein Sævik, and **Zhengru Ren**. Onboard tuning of vessel seakeeping model parameters and sea state characteristics. *Marine Structures*, 78:102998, 2021. [中科院小类一区 Top, 影响因子:3.458].

[8] Amrit Shankar Verma*, Sandro Di Noi, **Zhengru Ren**, Zhiyu Jiang, and Julie J.E. Teuwen. Minimum leading edge protection application length to combat rain-induced erosion of wind turbine. *Energies*, 14(6):1629, 2021. [中科院小类四区, 影响因子:3.004].

[9] Kamran Ali Shah, Fantai Meng*, Ye Li*, Ryozo Nagamune, Yarong Zhou, **Zhengru Ren**, and Zhiyu Jiang. A synthesis of feasible control methods for floating offshore wind turbine system dynamics. *Renewable & Sustainable Energy Reviews*, 151:111525, 2021. [中科院小类一区 Top, 影响因子:14.982].

[10] Hongyu Zhou, **Zhengru Ren***, and Roger Skjetne. Stepwise path planning with anti-collision using stream function for marine vessels. *IEEE Transactions on Control Systems Technology*, 2021. Accepted, [中科院小类二区, 影响因子:5.485].

[11] **Zhengru Ren***, Bo Zhao, and Dong Trong Nguyen. Finite-time neural adaptive control of a class of nonlinear system: Proved by Bernoulli inequality. *IEEE Access*, 8:47768–47775, 2020. [中科院小类二区 Top, 影响因子:3.367].

[12] **Zhengru Ren**, Roger Skjetne, Zhiyu Jiang*, and Zhen Gao. Active single-blade installation using tugger line tension control and optimal control allocation. *International Journal of Offshore and Polar Engineering*, 30(2):220–227, 2020. [中科院小类四区, 影响因子:0.670].

[13] Amrit Shankar Verma*, Zhiyu Jiang, **Zhengru Ren**, Marco Caboni, Hans Verhoef, Harald van der Mijle Meijer, Saullo G.P. Castro, and Julie J.E. Teuwen. A probabilistic long-term framework for site-specific erosion analysis of wind turbine blades: A case study of 31 Dutch sites. *Wind Energy*, pages 1315–1336, 2021. [中科院小类三区, 影响因子:2.730].

[14] Amrit Shankar Verma*, Zhiyu Jiang, **Zhengru Ren**, Weifei Hu, and Julie Teuwen. Effects of onshore and offshore environmental parameters on leading edge erosion of wind turbine blades: A comparative study. *Journal of Offshore Mechanics and Arctic Engineering*, 143(4):042001, 2020. [中科院小类四区, 影响因子:1.355].

[15] Ming Song*, Bin Qin, Li Zhou, and **Zhengru Ren**. A three-dimensional model for strength assessment of type-c independent cargo tank structures. *Journal of Ship Production and Design*, 36(04):271–279, 2020. [中科院小类四区, 影响因子:1.141].

[16] Roger Skjetne and **Zhengru Ren***. A survey on modeling and control of thruster-assisted position mooring systems. *Marine Structures*, 74:102830, 2020. [中科院小类一区 Top, 影响因子:3.458].

[17] **Zhengru Ren***, Roger Skjetne, and Zhen Gao. A crane overload protection controller for blade lifting operation based on model predictive control. *Energies*, 12(1):50, 2019. **ESI highly-cited paper** [中科院小类四区, 影响因子:3.004].

[18] **Zhengru Ren***, Roger Skjetne, Zhiyu Jiang, Zhen Gao, and Amrit Shankar Verma. Integrated GNSS/IMU hub motion estimator for offshore wind turbine blade installation. *Mechanical Systems and Signal Processing*, 123:222–243, 2019. **ESI highly-cited paper** [中科院小类一区 Top, 影响因子:6.823].

[19] Amrit Shankar Verma*, Zhiyu Jiang, **Zhengru Ren**, Zhen Gao, and Nils Petter Vedvik. Response-based assessment of operational limits for mating blades on monopile-type offshore wind turbines. *Energies*, 12(10):1867, 2019. [中科院小类四区, 影响因子:3.004].

[20] Amrit Shankar Verma, Zhiyu Jiang*, Nils Petter Vedvik, Zhen Gao, and **Zhengru Ren**. Impact assessment of a wind turbine blade root during an offshore mating process. *Engineering Structures*, 180:205–222, 2019. [中科院小类二区 Top, 影响因子:4.471].

[21] Ming Song, Wei Shi, **Zhengru Ren**, and Li Zhou*. Numerical study of the interaction between level ice and wind turbine tower for estimation of ice crushing loads on structure. *Journal of Marine Science and Engineering*, 7(12):439, 2019. [中科院小类二区, 影响因子:2.458].

[22] **Zhengru Ren**, Zhiyu Jiang*, Roger Skjetne, and Zhen Gao. Active tugger line force control method for single blade installations. *Wind Energy*, 21:1344–1358, 2018. [中科院小类三区, 影响因子:2.730].

[23] **Zhengru Ren**, Zhiyu Jiang*, Roger Skjetne, and Zhen Gao. Development and application of a simulator for offshore wind turbine blades installation. *Ocean Engineering*, 166:380–395, 2018. [中科院小类一区 Top, 影响因子:3.795].

[24] Jiafeng Xu, **Zhengru Ren***, Yue Li, Roger Skjetne, and Karl Henning Halse. Dynamic simulation and control of an active roll reduction system using free-flooding tanks with vacuum pumps. *Journal of Offshore Mechanics and Arctic Engineering*, 140:061302, 2018. [中科院小类四区, 影响因子:1.355].

[25] Zhiyu Jiang, Zhen Gao, **Zhengru Ren**, Ye Li*, and Lei Duan. A parametric study on the blade mating process for monopile wind turbine installations under rough environmental conditions. *Engineering Structures*, 172:1042 – 1056, 2018. [中科院小类二区 Top, 影响因子:4.471].

[26] Zhiyu Jiang, Weifei Hu, Wenbin Dong, Zhen Gao, and **Zhengru Ren***. Structural reliability analysis of wind turbines: a review. *Energies*, 10:2099, 2017. [中科院小类四区, 影响因子:3.004].

[27] Hui Liang*, Zhi Zong, Lei Sun, Li Zou, Li Zhou, Yanjie Zhao, and **Zhengru Ren**. Generalized weissinger's L-method for prediction of curved wings operating above a free surface in subsonic flow. *Journal of Engineering Mathematics*, 83(1):109–129, 2013. [中科院小类四区, 影响因子:1.509].

EI 期刊

[1] Fan Gao, Astrid H. Brodtkorb, Sigrid Marie Mo, **Zhengru Ren**, and Asgeir J. Sørensen. Adaptive backstepping control of ship speed tracking and hybrid mode selection. *IFAC-PapersOnLine*, 54(16):63–69, 2021.

[2] Amrit Shankar Verma*, Zhiyu Jiang, **Zhengru Ren**, Zhen Gao, and Nils Petter Vedvik. Effects of wind-wave misalignment on a wind turbine blade mating process: impact velocities, blade root damages and structural safety assessment. *Journal of Marine Science and Application*, 19:218–233, 2020.

[3] **Zhengru Ren** and Roger Skjetne. An on-site current profile estimation algorithm for a moored floating structure. *IFAC-PapersOnLine*, 49(23):153–158, 2016.

[4] **Zhengru Ren** and Roger Skjetne. A tension-based position estimation solution of a moored structure and its uncertain anchor positions. *IFAC-PapersOnLine*, 49(23):251–257, 2016.

[5] **Zhengru Ren**, Roger Skjetne, and Øivind Käre Kjerstad. A tension-based position estimation approach for moored marine vessels. *IFAC-PapersOnLine*, 48(16):248–253, 2015.

[6] **Zhengru Ren**, Roger Skjetne, and Vahid Hassani. Supervisory control of line breakage for thruster-assisted position mooring system. *IFAC-PapersOnLine*, 48(16):235–240, 2015.

EI 会议

[1] Amrit Shankar Verma, Zhiyu Jiang, **Zhengru Ren**, and Julie Teuwen. Leading edge erosion of wind turbine blades: Effects of environmental parameters on impact velocities and erosion damage rate. In *ASME 2020 39th International Conference on Ocean, Offshore and Arctic Engineering*, pages OMAE2020–18173. American Society of Mechanical Engineers, 2020.

[2] Zhiyu Jiang, Bjørnholm Marius, Jiamin Guo, Wenbin Dong, **Zhengru Ren**, and Amrit Shankar Verma. Damage identification of a jacket support structure for offshore wind turbines. In *The 15th IEEE Conference on Industrial Electronics and Applications (ICIEA2020)*, pages 995–1000. IEEE, 2020.

[3] Amrit Shankar Verma, Zhen Gao, Zhiyu Jiang, **Zhengru Ren**, and Nils Petter Vedvik. Structural safety assessment of marine operations from a long-term perspective: A case study of offshore wind turbine blade installation. In *ASME 2019 38th International Conference on Ocean, Offshore and Arctic Engineering*. American Society of Mechanical Engineers Digital Collection, 2019.

[4] Zhen Gao, Amrit Shankar Verma, Yuna Zhao, Zhiyu Jiang, and **Zhengru Ren**. A summary of the recent work at NTNU on marine operations related to installation of offshore wind turbines. In *ASME 2018 37th International Conference on Ocean, Offshore and Arctic Engineering*, page V11AT12A044. American Society of Mechanical Engineers, 2018.

[5] **Zhengru Ren**, Zhiyu Jiang, Roger Skjetne, and Zhen Gao. Single blade installation using active control of three tugger lines. In *The 28th International Ocean and Polar Engineering Conference*, pages 594–601. International Society of Offshore and Polar Engineers, 2018.

[6] Zhiyu Jiang, **Zhengru Ren**, Zhen Gao, Karl Henning Halse, and Peter Christian Sandvik. Mating control of a wind turbine tower-nacelle-rotor assembly for a catamaran installation vessel. In *Proceedings of the 2018 International Ocean and Polar Engineering Conference*, pages 584–593. International Society of Offshore and Polar Engineers, 2018.

[7] **Zhengru Ren**, Roger Skjetne, and Zhen Gao. Modeling and control of crane overload protection during marine lifting operation based on model predictive control. In *ASME 2017 36th International Conference on Ocean, Offshore and Arctic Engineering*, pages OMAE2017–62003. American Society of Mechanical Engineers, 2017.

[8] Jiafeng Xu, **Zhengru Ren**, Yue Li, Roger Skjetne, and Karl Henning Halse. Dynamic simulation and control of an active roll reduction system using free-flooding tanks with vacuum pumps. In *ASME 2017 36th International Conference on Ocean, Offshore and Arctic Engineering*, pages OMAE2017–61292. American Society of Mechanical Engineers, 2017.

中文核心

[1] 周利, 段玉响, **任政儒**, and 安松. 主动式升沉补偿控制系统及运动预报. 华中科技大学学报 *(*自然科学版*)*, 2021.

[2] 段玉响, **任政儒**, and 周利. 主动式升沉补偿技术研究现状和发展趋势. 舰船科学技术, 2020.

[3] **任政儒**, 倪少玲, 李海涛, and 李隆帜. 船模性能虚拟实验教学软件开发和应用. 船海工程, 43(1):95–98, 2014.

[4] 倪少玲, **任政儒**, 李海涛, and 邵昊燕. 船模阻力虚拟试验教学系统开发研究. 船海工程, 41(6):34–37, 2012.

其他

[1] 段玉响, 周利, **任政儒**, and 安松. 基于 simscape 的海上钻井平台升沉补偿系统仿真研究. 第十九届中国海洋*(*岸*)* 工程学术讨论会论文集, 2019.

[2] Jingzhe Jin, Vatne Sigrid Ringdalen Jiang, Zhiyu, **Zhengru Ren**, Yuna Zhao, and Zhen Gao. Installation of pre-assembled offshore wind turbines using a catamaran vessel and an active gripper motion control method. In *Grand Renewable Energy 2018 Proceedings*, 2018.

国家发明专利

1. 赵永生, 谢斯泓, 许移庆, 蒋致禹, **任政儒**, 何炎平, 周岱, 许玉旺, 韩兆龙, 黄超, 谷孝利. 适用于风机叶片安装的吊具运动控制系统及控制方法, 2021.02.23, CN112390136A(发明专利)
2. **任政儒**, 施伟, 王亚坡, 张松浩, 宋兆波, 周波, 万岭. 一种适用于海上或陆上的负载载荷吊装主动减摇控制方法, 2021.03.26, CN111170176B (发明专利)
3. **任政儒**, 施伟, 宋兆波, 蒋致禹, 张礼贤, 由际昆. 实现双向合力控制的吊机延伸加装装置及双向张力控制吊车的方法, 2020.07.24, CN110654987B (发明专利)
4. 施伟，张礼贤，蒋致禹，**任政儒**，宁德志，周利. 海上波能-风能集成系统及集成发电方法，2020.06.02, CN109441727B (发明专利)
5. 蒋致禹, **任政儒**, 施伟, 宁德志. 一种基于独立变桨的风电机组控制和制动方法, 2020.01.10, CN109139372B (发明专利)
6. **任政儒**，蒋致禹，施伟，由际昆，宁德志. 用于风机单叶片安装的主动反馈控制方法和装置，2020.01.10, CN109139389B (发明专利)
7. **任政儒**, 蒋致禹, 施伟, 宁德志. 基于锚链张力和立管上端角的水下流速剖面估计方法, 2019.12.17, CN107966585B (发明专利)
8. **任政儒**，蒋致禹，施伟，宁德志，周利. 一种适用于水平轴风机的防叶片抛飞的安全装置，2019.09.27, CN107989828B (发明专利)
9. **任政儒**, 蒋致禹, 施伟, 宁德志. 一种锚泊海洋结构物锚链断裂的实时监测方法, 2019.06.21, CN107991070B (发明专利)

国际发明专利

1. 蒋致禹, **任政儒**, 施伟, 宁德志. 一种适用于海上单桩式风机安装的主动式阻尼装置 (Active tuned mass damper applied to offshore monopile wind turbine installation), 申请日: 2021.09.14, US11118646B2（美国专利）

2. 施伟，蒋致禹，**任政儒**，宁德志。一种新型浮式风能-波浪能联合发电系统 (Floating wind-wave integrated power genreration system),2021.03.16, US10947952B2（美国专利)

3. 蒋致禹，**任政儒**，施伟，宁德志。一种适用于海上风机单叶片安装的轮毂对接装置 (Hub mating mechanism applicable to sing blade installation of offshore wind turbines)，2020.11.17, US10837425B2（美国专利）

4. **任政儒**, 蒋致禹, 施伟, 宁德志. 一种用于海上风机塔筒安装的减摇装置 (Anti-swing device for offshore wind turbine tower installation), 2020.06.30, US010697435B2（美国专利）

已授权实用新型专利, 发明专利待审批

1. 蒋致禹, **任政儒**, 施伟, 宁德志. 一种适用于海上风机单叶片安装的轮毂对接装置, 申请日: 2017.9.11, 申请号: PCT/CN2017/101168, 美国专利申请号: US10837425B2, 进入主权国家日: 2019.04.05（美国专利）

2. 施伟, 周林, **任政儒**, 由际昆, 宁德志, 勾莹. 一种基于浮式风机和潮流能装置的深海能源集成系统, 申请日: 2018.03.06, CN Grant CN207960842U（实用新型）, 申请号 201810211962X（发明专利）

3. 施伟, 蒋致禹, **任政儒**, 宁德志. 一种适用于近海的单桩式风能-波浪能集成发电系统, 申请日: 2017.11.09, CN, Grant CN207420785U (实用新型); 申请号: CN2017110985681 （发明专利）

4. **任政儒**, 蒋致禹, 施伟, 宁德志. 一种基于爆破的海上单桩风机的整体拆卸装置与方法, 申请日：2018.01.08, CN, Grant CN207710215U (实用新型); 申请号: CN2018200263053 （发明专利）

发明公布

1. 蒋致禹, 施伟, 曾昕萌, **任政儒**, 张礼贤, 翟钢军. 适用于海上浮式风机安装的防波装置及其安装海上浮式风机的方法, 申请日: 2019.09.29, 申请号: CN2019109321335

2. **任政儒**, 蒋致禹, 施伟, 宁德志. 基于锚链张力的定位方法及卫星定位失灵的检测方法, 申请号: CN201711033438X

国际期刊及会议审稿人

Marine Structures

Ocean Engineering

Applied Ocean Research

Journal of Offshore Mechanics and Arctic Engineering

Journal of Marine Science and EngineeringIEEE Transactions on Intelligent Transportation Systems

IEEE Transactions on Neural Networks and Learning Systems

IEEE Transactions on Systems, Man, and Cybernetics: Systems

IEEE Access

Engineering Structures

Journal of Materials Research and Technology

International Journal of Energy Applications and Technologies

Energies

IFAC Conference on Control Applications in Marine Systems (CAMS)

International Conference on Ocean, Offshore and Arctic Engineering (OMAE)

International Offshore and Polar Engineering Conference (ISOPE)

International Offshore Wind Technical Conference (IOWTC)

IFAC World Congress

其他经历

奖学金及获奖情况

挪威科技大学全额博士奖学金, 2016–2018

全国大学生计算机程序设计大赛优秀奖, 2012

大连理工大学优秀毕业生, 2012

全国教育教学创新与发展高端论坛, 三等奖, 2011

辽宁省 3D 建模大赛省二等奖、省三等奖, 2011

“北斗杯” 全国青少年科技创新大赛全国一等奖, 2011

大连理工大学社会实践奖学金, 2009–2011

大连理工大学文体活动奖学金, 2010