



杨忠年 博士生导师

职 称：教授

研究方向：土动力学、岩土工程、隧道工程、原位测试

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个人简介

青岛理工大学泰山学者岩土工程创新团队骨干成员，美国宾夕法尼亚州立大学访问学者、国际工程地质与环境协会(IAEG)海洋工程地质委员会理事、中国土木工程学会土力学及岩土工程分会非饱和土与特殊土专业委员会委员，中国岩石力学学会极地岩土工程委员会委员。研究工作主要围绕特殊土土力学、原位测试及岩土工程病害防控，近年发表论文 60 余篇，其中以第一或通讯作者发表 SCI 论文 40 篇，授权专利 20 余项，主持国家自然科学基金 3 项，参与国家重点研发计划 2 项、主持省级重点研究计划及企业科研课题 10 余项、获得省级/学会奖项 10 余项。指导研究生获得研究生国家奖学金、研究生新生奖学金、一等综合奖学金、二等综合奖学金、优秀毕业生论文、山东省优秀毕业生等各种奖项。其中，硕士毕业生读博率超过 90%，成功申请就读于哈尔滨工业大学、中国科学院、东南大学、同济大学、天津大学、大连理工大学、中国海洋大学等顶尖科研院所。

学习经历

- 2004.09-2008.07, 中国矿业大学, 地质工程, 工学学士
- 2008.09-2011.07, 中国海洋大学, 环境岩土工程, 工学硕士
- 2011.09-2015.12, 中国海洋大学, 环境岩土工程, 工学博士
- 2018.12-2019.12, 美国宾夕法尼亚州立大学, 工程学部, 访问学者

工作经历

- 2015.09-2024.07, 青岛理工大学土木工程学院, 副教授
- 2024.08-至今, 青岛理工大学土木工程学院, 教授、博士生导师

学术兼职

- 国际工程地质与环境协会(IAEG)海洋工程地质委员会理事
- 中国土木工程学会土力学及岩土工程分会非饱和土与特殊土专业委员会委员
- 中国岩石力学学会极地岩土工程委员会委员

教科研项目

- 基于 T-CPTu 粉质土热交换下应力松弛特性及能源桩长期承载性能研究，国家自然科学基金面上项目，主持
- 基于 CPTu 和波速表征的水合物储层开采条件下物理力学特性演化机制，国家自然科学基金面上项目，主持
- 波流联合作用下黄河口浮泥层发育机制及运移模式研究，国家自然科学基金青年基金，主持
- 含气粘土海床桩基水平刚度循环弱化机理研究，山东省科学技术厅，山东省重点研发计划，主持
- 深季节冻土高铁膨胀岩人工路堑边坡劣化特性与失稳机理研究，冻土工程国家重点实验室开放基金，主持
- 青岛地区暗挖车站结构设计及工法的标准化研究，青岛市地铁一号线有限公司，主持
- 滨海地铁车站基坑快速支护成套关键技术研究，青岛地铁西海岸轨道交通有限公司，主持
- 鞍钢尾矿砂固化关键技术研究，鞍钢集团矿业设计研究院有限公司，主持
- 光纤光栅无损检测技术在围护结构渗漏检测中的适用性和精准性研究，中铁二十五局集团，主持
- 青岛复杂地层条件下隧道综合地球物理探测技术研究，中铁二十五局集团，主持
- 云南华坪至丽江段隧道设计阶段风险评估，中交公路规划设计院有限公司，主持

学术成果

代表性著作、论文：

- [1] Yang Zhongnian, Lu Zhaochi, Shi Wei, et al. (2024). Effects on the micropore structure and unfrozen water content in expansive soil under freeze-thaw cycles via low-field NMR. *Geomechanics and Geoengineering*.
- [2] Yang Zhongnian, Sun Zhenxing, Cai Guojun, et al. (2024). Elastic-plastic constitutive relationship of polymer fiber-reinforced clay considering the effect of anisotropic distribution. *International Journal of Geomechanics*.
- [3] Yang Zhongnian, Xu Zhengyi, Qin Xipeng, et al. (2024). Evaluation of correlation between plasticity indicator

and residual friction angle of fine-grained soils based on the flow index. *Bulletin of Engineering Geology and the Environment*.

- [4] **Yang Zhongnian**, Lu Zhaochi, Shi Wei, et al. (2024). Experimental investigation of freeze–thaw effects on the micropore properties of expansive soil using NMR–SEM techniques. *Granular Matter*.
- [5] **Yang Zhongnian**, Sun Zhenxing, Ling Xianzhang, et al. (2024). Influence of mixing rubber fibers on the mechanical properties of expansive clay under freeze–thaw cycles. *Applied Sciences*.
- [6] **Yang Zhongnian**, Cheng Zhaojie, Cai Guojun, et al. (2024). Ternary medium constitutive model of frozen rubber-reinforced expansive soil. *Geosynthetics International*.
- [7] Wang Rongchang, **Yang Zhongnian**, Ling Xianzhang, et al. (2024). Constitutive damage model for rubber fiber-reinforced expansive soil under freeze–thaw cycles. *Materials*.
- [8] Cui Yuxue, Liu Tao, **Yang Zhongnian**, et al. (2024). Effect of salt solution concentration and cation types on the mechanical properties of bentonite as a barrier material. *Bulletin of Engineering Geology and the Environment*.
- [9] Xu Zhengyi, **Yang Zhongnian**, Wang Youquan, et al. (2024). Spatial variability of seabed liquefaction in the Yellow River Subaquatic Delta based on CPT. *Marine Georesources & Geotechnology*.
- [10] Sun Zhenxing, Wang Rongchang, **Yang Zhongnian**, et al. (2024). Dynamic behavior of rubber fiber-reinforced expansive soil under repeated freeze–thaw cycles. *Polymers*.
- [11] Zhang Yingying, Qin Xipeng, Bian Youyan, Xu Zhengyi, **Yang Zhongnian**, et al. (2024). Sequential Gaussian simulation predicts soil liquefaction potential. *Marine Georesources & Geotechnology*.
- [12] **Yang Zhongnian**, Cheng Zhaojie, Cui Yuxue, et al. (2023). Dynamic properties of frozen rubber-reinforced expansive soils under confining pressure. *Geosynthetics International*.
- [13] **Yang Zhongnian**, Lu Zhaochi, Shi Wei, et al. (2023). Investigation of rubber content and size on dynamic properties of expansive soil-rubber. *Geosynthetics International*.
- [14] **Yang Zhongnian**, Cheng Zhaojie, Ling Xianzhang, et al. (2023). An updated binary medium constitutive model of frozen rubber reinforced expansive soil under confining pressure. *Cold Regions Science and Technology*.
- [15] **Yang Zhongnian**, Lu Zhaochi, Shi Wei, et al. (2023). Dynamic properties of expansive soil-rubber under freeze–thaw cycles. *Journal of materials in civil engineering*.
- [16] Qin Xipeng, **Yang Zhongnian**, Cui Yuxue, et al. (2023). Spatial distribution characteristics of soil liquefaction potential in the Yellow River Subaquatic Delta, China. *Marine Georesources & Geotechnology*.

- [17] Cui Yuxue, Guo Lei, Liu Tao, **Yang Zhongnian**, et al. (2023). Development and application of the 3000 m-level multiparameter CPTu in-situ integrated test system. *Marine Georesources & Geotechnology*.
- [18] Liu Xuesen, Liu Tao, Wang Hailiang, **Yang Zhongnian**, et al. (2023). CPT-based evaluation of silt/clay contents and the shear wave velocity of seabed soils in the Yellow River delta. *Bulletin of Engineering Geology and the Environment*.
- [19] Liu Xuesen, Liu Tao, Wang Hailiang, **Yang Zhongnian**, Cui Yuxue, Xu Zhengyi, et al. (2023). CPT-based evaluation of silt/clay contents and the shear wave velocity of seabed soils in the Yellow River delta. *Bulletin of Engineering Geology and the Environment*.
- [20] **Yang Zhongnian**, Cui Yuxue, Guo Lei, et al. (2022). Semi-empirical correlation of shear wave velocity prediction in the Yellow River Delta based on CPT. *Marine Georesources & Geotechnology*.
- [21] **Yang Zhongnian**, Liu Xuesen, Guo Lei, et al. (2022). Effect of silt/clay content on shear wave velocity in the Yellow River Delta (China), based on the cone penetration test (CPT). *Bulletin of Engineering Geology and the Environment*.
- [22] **Yang Zhongnian**, Liu Xuesen, Guo Lei, et al. (2022). CPT-Based estimation of undrained shear strength of fine-grained soils in the Huanghe River Delta. *Acta Oceanologica Sinica*.
- [23] **Yang Zhongnian**, Liu Xuesen, Guo Lei, et al. (2022). Evaluation of the soil characteristic parameters of the Yellow River Subaqueous Delta using CPT. *Marine Georesources & Geotechnology*.
- [24] **Yang Zhongnian**, Liu Xuesen, Su Xiuting, et al. (2022). CPT-Based evaluation of sediment characteristics and effective internal friction angle in the yellow river estuary. *Marine Georesources & Geotechnology*.
- [25] **Yang Zhongnian**, Lu Zhaochi, Shi Wei, et al. (2022). Effect of freeze-thaw cycles on the dynamic parameters of modified Na⁺-bentonite by different cations. *Bulletin of Engineering Geology and the Environment*.
- [26] **Yang Zhongnian**, Zhang Qi, Shi Wei, et al. (2022). Study of a strength prediction model of unsaturated compacted expansive soil under freeze–thaw cycles. *Arabian Journal of Geosciences*.
- [27] Guo Lei, Liu Xuesen, **Yang Zhongnian**, et al. (2022). CPT-based analysis of structured soil characteristics and liquefaction failure of the Yellow River Subaquatic Delta. *Marine Georesources & Geotechnology*.
- [28] Lv Jianhang, **Yang Zhongnian**, Shi Wei, et al. (2022). Dynamic Characteristics of Rubber Reinforced Expansive Soil (ESR) at Positive and Negative Ambient Temperatures. *Polymers*.
- [29] **Yang Zhongnian**, Liu Xuesen, Guo Lei, et al. (2021). Soil classification and site variability analysis based on cpt-

a case study in the Yellow River Subaquatic Delta, China. *Journal of Marine Science and Engineering*.

- [30] **Yang Zhongnian**, Lv Jianhang, Shi Wei, et al. (2021). Experimental study of the freeze thaw characteristics of expansive soil slope models with different initial moisture contents. *Scientific Reports*
- [31] **Yang Zhongnian**, Lv Jianhang, Shi Wei, et al. (2021). Model test study on stability factors of expansive soil slopes with different initial slope ratios under freeze-thaw conditions. *Applied Sciences-Basel*.
- [32] **Yang Zhongnian**, Liu Xuesen, Zhang Liang, et al. (2021). Dynamic behavior of geosynthetic-reinforced expansive soil under freeze-thaw cycles. *Advances in Civil Engineering*.
- [33] **Yang Zhongnian**, Cui Yuxue, Li Guoyu, et al. (2020). Effect of freeze-thaw cycles on the physical and dynamic characteristic of modified Na-bentonite by KCL. *Arabian journal of geosciences*.
- [34] **Yang Zhongnian**, Zhang Qi, Shi Wei, et al. (2020). Advances in properties of rubber reinforced soil. *Advances in Civil Engineering*.
- [35] **Yang Zhongnian**, Zhang Liang, Ling Xianzhang, et al. (2019). Experimental study on the dynamic behavior of expansive soil in slopes under freeze-thaw cycles. *Cold Regions Science and Technology*.
- [36] **Yang Zhongnian**, Zhu Yongmao, Liu Tao, et al. (2019). Pumping effect of wave-induced pore pressure on the development of fluid mud layer. *Ocean Engineering*.
- [37] **Yang Zhongnian**, Zhu Yongmao, Liu Tao, et al. (2019). Contribution of pumping action of wave-induced pore-pressure response to development of fluid mud layer. *Journal of Marine Science and Engineering*.

代表性专利:

- [1] 楊忠年, 劉泉維, 陳宏偉等.(2023) プレストレストアンカーケーブルの拡張可能式内側アンカーヘッド. 日本專利.
- [2] 楊忠年, 劉泉維, 黃成等.(2022) セルフドリル式管柱サポート装置及びその方法. 日本專利.
- [3] **Yang Zhongnian**, Xu Zhengyi, Liu Quanwei, et al. (2023) Grouting Device for High-Coagulability Grouting Material. 美国專利.
- [4] 楊忠年, 王榮昌, 時偉等.(2024) 基于 XRD 的盐度场变化下土体膨胀压力测试装置, 发明.
- [5] 楊忠年, 胥正一, 刘齐辉等.(2024) 一种实现黏粒含量评估的土壤分类方法, 发明.
- [6] 刘泉維, 楊忠年, 黃成等.(2024) 黏土固化剂和应用黏土固化剂的可泵送混凝土及制备方法, 发明.
- [7] 楊忠年, 秦夕朋, 陈宏伟等.(2023) 一种固化铁尾矿的路基填料及路基的施工方法, 发明.
- [8] 楊忠年, 劉泉維, 黃習習等.(2019) 高强快速锚固剂及其浆液的制备方法, 发明.

- [9] 杨忠年,张亮,王勇等.(2019) 一种模拟冻融循环快速测试土体强度及渗透系数的试验装置, 发明.
- [10] 杨忠年, 张亮, 罗永旭等.(2019) 一种应用于细粒土控制压实度的制样装置, 发明.
- [11] 杨忠年, 张亮, 时伟等.(2020) 基于电化学改良的季节性冻土综合力学测试装置及其方法, 发明.
- [12] 杨忠年, 张亮, 张莹莹等.(2020) 干湿循环作用下电化学改良土体力学特性测试装置及方法, 发明.
- [13] 杨忠年, 张亮, 王勇等.(2020) 一种模拟干湿循环的多参数微型试验装置及其使用方法, 发明.
- [14] 杨忠年, 张亮, 时伟等.(2021) 基于渗透压力模拟的岩体抗剪强度测试装置及其方法, 发明.
- [15] 刘泉维, 杨忠年, 王洪波等.(2021) 自钻式管柱支护装置及其方法, 发明.
- [16] 刘泉维, 杨忠年, 李克先等.(2021) 用于高凝结性注浆材料的注浆装置, 发明.
- [17] 刘泉维, 杨忠年, 李克先等.(2021) 预应力锚索可扩张式内锚头, 发明.
- [18] 张亮, 杨忠年, 张莹莹等.(2019) 一种实现多物理场耦合的环境模拟试验系统, 发明.
- [19] 时伟, 张亮, 杨忠年等.(2019) 一种考虑温度梯度下土体胀缩特性的静动力综合试验系统, 发明.
- [20] 刘泉维, 杨忠年, 李克先等.(2022) 一种适用于新型锚固材料的智能注浆设备及其施工方法, 发明.

代表性著作:

硬岩地层地铁修建关键技术	人民交通出版社	2017	编委
城市轨道交通工程硬岩双护盾 TBM 隧道修建关键技术	人民交通出版社	2018	编委
特种结构剂与特种黏土固化浆液	科学出版社	2022	编委

荣誉奖励

- 2024 中国岩石力学与工程学会科技进步一等奖,“工程地质多源精准原位测试与智能分析关键技术及应用”
- 2024 安徽省教学成果特等奖,“工程问题导向的‘三目标四融合’本科教学模式创新与实践”
- 2024 詹天佑铁道科学技术奖创新团队,“高速铁路严寒区岩土工程创新团队”
- 2024 山西省科技进步二等奖,“铁路工程路基改良与病害防控岩土关键技术”
- 2023 公路学会科技进步一等奖,“软土路基快速精准检测、高性能加固材料及先进装备成套技术研究”
- 2023 中国岩石力学与工程学会科技进步一等奖,“大跨隧道主动支护理论与建造成套技术”
- 2022 山东省第九届教学成果二等奖,““四要素、五维度、三融合”土建类岩土系列课程教学创新与实践”
- 2021 山东省科技进步奖二等奖,“近海风电桩基工程施工与服役基础理论及保障关键技术”
- 2021 山东轨道交通科学技术二等奖,“复杂环境硬岩地区地铁绿色高效施工关键技术及工程应用”
- 2021 青岛市科技进步二等奖,“滨海环境高耐久清水混凝土成套技术研发与工程应用”
- 2020 山东省研究生优秀成果奖一等奖指导老师