

Curriculum Vitae

Personal Information

Name: Mengxuan Gao
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Citizenship: P. R. China
Keywords: 3D printing, Mechanical Design, Machine learning,
Multiphysics Simulation



Education

Apr. 2024-Now	The University of Hong Kong (HKU)	Intelligent manufacturing
Sept. 2021 -	Beihang University	Mechanical Engineering
Jan. 2024	Master's degree	GPA: 90.42/100 (Rank: 1/190)
Sept. 2017-	Beijing University of Technology	Mechanical Engineering
Jul. 2021	Bachelor's degree	GPA: 90.58/100 (Rank: 4/111)

Research Experience

Science Center for Gas Turbine Project (P2022-AB-IV-002-002) Sept. 2021-Dec. 2023

Precision manufacturing of composite materials

Researcher

- Designed water-guided laser machining experiments, employed computer vision methods to extract machining quality characteristic parameters, and established correlations with various machining parameter combinations.
- Developed a theoretical model for waterjet-guided laser machining of SiC/SiC composite materials in COMSOL Multiphysics and validated it with actual machining results.
- Utilized neural networks to predict machining outcomes and employed multi-objective optimization algorithms to determine the optimal combination of machining parameters.
- Investigated the material removal mechanisms of SiC/SiC composite materials under femtosecond and waterjet-guided laser conditions through various characterization methods.

Professional Skills

- ✧ Familiar with mechanical design and manufacturing, with strong expertise in CNC machining, laser cutting, FFF 3D printing, stereolithography (SLA) 3D printing, and other related technologies.
- ✧ Proficient in CAD, CAM, and CAE software, including Autodesk Inventor, SOLIDWORKS, NX, and AutoCAD, with extensive experience in multiphysics simulation using COMSOL. Additionally skilled in KeyShot for rendering and Fusion 360 for generative design.
- ✧ Applied PyTorch to develop neural network models for ECG signal classification and machining parameter optimization, enhancing processing efficiency and quality.

Publication ([Google Scholar](#))

- **Mengxuan Gao**, Songmei Yuan, *et al.* "Optimization of Processing Parameters for Waterjet-Guided Laser Machining of SiC/SiC Composites". *Journal of Intelligent Manufacturing*, Q1, IF = 7.4
(<https://doi.org/10.1007/s10845-023-02225-x>)
- Ning Zhou, Songmei Yuan, **Mengxuan Gao**, *et al.* *Investigations on the oxidation behavior*

and removal mechanism of SiC/SiC composites by multi-pulse femtosecond laser ablation.

Journal of Materials Research and Technology. Q1, IF = 6.6

(<https://doi.org/10.1016/j.jmrt.2023.08.134>)

- Jiayong Wei, Songmei Yuan, Jiaqi Zhang, Ning Zhou, Wei Zhang, Jiebo Li, Wenzhao An, **Mengxuan Gao**, Yanzhe Fu. *Femtosecond laser ablation behavior of SiC/SiC composites in air and water environment. Corrosion Science. Q1, IF = 8.3*
(<https://doi.org/10.1016/j.corsci.2022.110671>)
- Jiayong Wei, Songmei Yuan, Jiaqi Zhang, Ning Zhou, Wei Zhang, Jiebo Li, Wenzhao An, **Mengxuan Gao**, Yanzhe Fu. *Removal mechanism of SiC/SiC composites by underwater femtosecond laser ablation. Journal of the European Ceramic Society. Q1, IF = 5.7*
(<https://doi.org/10.1016/j.jeurceramsoc.2022.05.041>)

Patents

- Jianhua Wang, **Mengxuan Gao**, et al. "A hybrid humanoid-like five-finger mechanical hand with a combination of rigidity and flexibility" CN111469156B (**Granted**)
- Jianhua Wang, **Mengxuan Gao**, et al. "A lunar rover designed to assist in constructing a lunar base and collecting lunar rock samples" CN110104212A (**Granted**)
- Zehuan Zhao, **Mengxuan Gao**, Anni Tong, Tao Zan. "Transformable wheel/transformable wheel conversion device and transformable wheel" CN115270616A (**Granted**)
- Xuan Jiang, Jin Zhou, **Mengxuan Gao**, Shaofei Wei, Zhengjie Wei, et al. "Non-slip sleeve and colonoscopy handle" CN111657841B (**Granted**)
- Shuwen Sun, Mingrui Luo, Chaoyang Shi, Jun Sun, **Mengxuan Gao**, Zehui Hong. "An automated device and control method for achieving large-scale time-lapse photography." CN109061998A (**Granted**)
- Songmei Yuan, **Mengxuan Gao**, Ning Zhou, Jiaqi Zhang, Jiayong Wei. "The method and device for predicting hole patterns in laser perforation of composite materials" CN115527632A (**Under Review**)
- Songmei Yuan, **Mengxuan Gao**, Jiaqi Zhang, Jiayong Wei, Ning Zhou. "The method and device for determining processing parameters of composite material laser drilling" (**Under Review**)

Honors & Awards

- ✓ 2021-2023 First class scholarship in Beihang University
- ✓ Beihang University Outstanding Freshman Scholarship (Top 5% in Department)
- ✓ Outstanding Graduate of Beihang University (Top 10% in Department)
- ✓ 2018-2020 First class scholarship in Beijing University of Technology
- ✓ Outstanding Graduate of Beijing University of Technology (Top 10% in Department)
- ✓ 2020 Autodesk National College Students Mechanical Products Digital Design Competition **First Prize (National Award)**
- ✓ 2019 China Service Robot Competition **First Prize (National Award)**
- ✓ 2019 Autodesk National College Students Mechanical Products Digital Design Competition **First Prize (National Award)**
- ✓ 2018 The 4th Beijing Engineering Design Expression Competition, Individual and Group **First Prize**