

## Dual Degree, Extra Committee Members

This Is A Thesis Title  
By  
Liao Min  
B.S. Chemistry  
ExampleA University, 2020

And

Lewis B. West  
B.S. Mechanical Engineering  
ExampleB University, 2021

SUBMITTED TO THE DEPARTMENT OF MECHANICAL ENGINEERING AND  
CENTER FOR COMPUTATIONAL SCIENCE & ENGINEERING  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREES OF MASTER OF SCIENCE IN  
MECHANICAL ENGINEERING  
AND  
MASTER OF SCIENCE IN COMPUTATIONAL SCIENCE & ENGINEERING AT THE  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
FEBRUARY 2023

©2023 Liao Min and Lewis B. West. All rights reserved.

The author hereby grants to MIT a nonexclusive, worldwide, irrevocable, royalty-free license to exercise any and all rights under copyright, including to reproduce, preserve, distribute and publicly display copies of the thesis, or release the thesis under an open-access license.

Authored by: Liao Min  
Department of Mechanical Engineering and Center for Computational Science & Engineering, January 14, 2022

Authored by: Lewis B. West  
Department of Mechanical Engineering and Center for Computational Science & Engineering, January 14, 2022

Certified by: Akari Watanabe  
Professor of Mechanical Engineering, Thesis Supervisor

Certified by: Beatrice J. Jansen  
Professor of Computational Science & Engineering, Thesis Supervisor

Approved by: Claudia Smith  
Department of Mechanical Engineering  
Chair, Committee for Graduate Students

Approved by: Yusuf Kipkirui  
Center for Computational Science & Engineering  
Chair, Committee for Graduate Students

## THESIS COMMITTEE

### Thesis Supervisors

Akari Watanabe, SM, PhD  
Professor of Mechanical Engineering

Beatrice J. Jansen, SM, PhD  
Professor of Computational Science & Engineering,

### Other Committee Members

Ana Smith, SM, PhD  
Professor of Mechanical Engineering

Ayyash Fozard, PhD  
Professor of Computational Science & Engineering

Jonah Cohen, PhD  
Professor of Mechanical Engineering