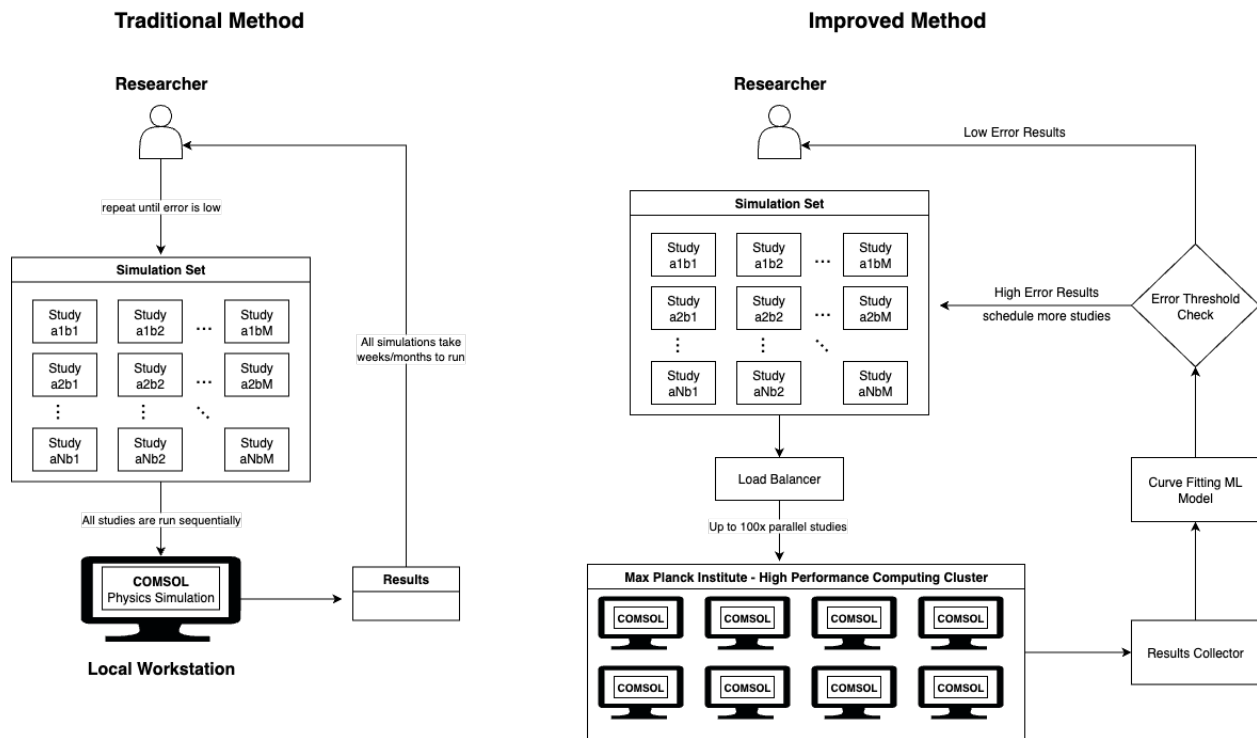


Optional Criteria 4.1 - Computational Physics Research at Max Planck Institute

During my research fellowship at Max Planck Institute for Intelligent Systems (2022), I was bound by the time it took to run CFD simulations on COMSOL, a physics simulation software. Running these simulations on local workstations took weeks or months, which severely limited our research velocity. I decided to move the entire testing suite to the Max Planck high-performance computing platform. This required extensive coordination - I had multiple meetings with the IT team to set up COMSOL on Linux and integrate it with the institute's job scheduling system. I then developed an ML-based job scheduling system that helps conduct CFD studies in a smarter way, achieving 200x faster data population. This breakthrough enabled 3 high-impact journal publications and 1 conference paper where I was co-first author on 2 of them. The papers have received over 25 citations and the number is increasing every day. After seeing my results, other PhD candidates at the lab across Germany also adopted my methodology and used the wiki page I created to replicate the setup.



High-level architecture of the HPC framework I developed - integrated COMSOL with Max Planck's job scheduling system

Scientific Reports

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
United Kingdom	Multidisciplinary	Nature Research	0.874 Q1
Universities and research institutions in United Kingdom	Multidisciplinary		H-INDEX
Media Ranking in United Kingdom			347

Nature Scientific Reports publication (Impact Factor: 3.9, h-index: 347) - co-first author

Advanced Intelligent Systems

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
United States	Computer Science	John Wiley and Sons Inc	1.140 Q1
Universities and research institutions in United States	Artificial Intelligence		H-INDEX
Media Ranking in United States	Computer Vision and Pattern Recognition		21
	Human-Computer Interaction		
	Engineering		
	Control and Systems Engineering		

Advanced Intelligent Systems journal cover featuring my research (Impact Factor: 6.8, h-index: 21) - co-first author

Advanced Theory and Simulations

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	SJR 2024
Germany	Mathematics	Wiley-VCH Verlag	0.612 Q1
Universities and research institutions in Germany	Modeling and Simulation		H-INDEX
Media Ranking in Germany	Numerical Analysis		47
	Statistics and Probability		
	Multidisciplinary		
	Multidisciplinary		

Advanced Theory and Simulations publication (Impact Factor: 2.9, h-index: 47) - co-author

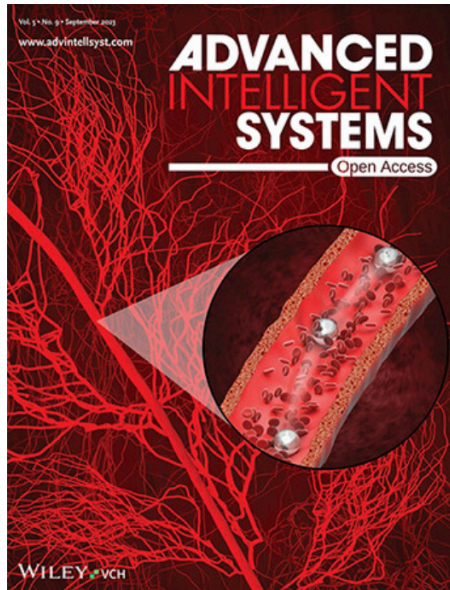
Back Cover

 **Open Access**

Microrobotic Locomotion in Blood Vessels: A Computational Study on the Performance of Surface Microrollers in the Cardiovascular System

Ugur Bozuyuk, Hakanca Ozturk, Metin Sitti

2370042 | First Published: 23 September 2023



Surface Microrollers

Magnetic surface microrollers possess great potential for the navigation in the circulatory system for applications such as drug delivery. Computational fluid dynamics analyses were conducted by Metin Sitti and co-workers (article number **2300099**) to investigate the performance of surface microrollers in the human circulatory system and it was found that the microrollers are effective in veins and arteries for locomotion.

Abstract | **PDF**

Advanced Intelligent Systems back cover featuring my microrobotics research

Key numbers: 200x simulation speedup • 4 publications (3 journals + 1 conference) • 2 co-first author papers • 25+ citations and growing • Journal cover selection • Methodology adopted by PhD candidates across Germany • Created wiki documentation used by other researchers • Reduced simulation time from months to days