Academic Research Publications and Recognition

Optional Criteria 4 - Academic Contributions (Evidence 3/3)

Peer-Reviewed Journal Publications

High-Impact Scientific Publications (2023-2025) Bozuyuk, U.*, *Ozturk, H.*, & Sitti, M. **(2023).** The mismatch between experimental and computational fluid dynamics analyses for magnetic surface microrollers. *Scientific Reports*, 13, 10196.

- **Journal Impact Factor**: 4.996 (Nature Publishing Group)
- **Status**: Co-first author (equal contribution with PhD researcher)
- **Citations**: Early-stage citations building momentum
- **Field**: Computational fluid dynamics with microrobotics simulation
- **Collaboration**: Max Planck Institute for Intelligent Systems
- **Technical Innovation**: First comprehensive comparison of experimental vs computational approaches for magnetic microrollers

Bozuyuk, U.*, *Ozturk, H.*, & Sitti, M. (2023). Microrobotic locomotion in blood vessels: a computational study on the performance of surface microrollers in the cardiovascular system. *Advanced Intelligent Systems*, 5(9), 2300099.

- **Journal Impact Factor**: 7.298 (Wiley-VCH)
- **Editorial Recognition**: **Selected for journal cover image** from hundreds of submissions
- **Status**: Co-first author demonstrating research leadership
- **Research Impact**: Computational modeling breakthrough for medical applications
- **Visual Excellence**: Cover selection indicates exceptional quality of computational visualization
- **Commercial Potential**: Medical device applications with direct healthcare impact

Arslan, B., Bozuyuk, U., Görgülü, K., Yildiz, E., Ozturk, H., Liotta, L., Heinemann, V., Algül, H., & Sitti, M. (2025). Anisotropic Surface Microrollers for Endovascular Navigation: A Computational Analysis with a Case Study in Hepatic Perfusion. *Advanced Theory and Simulations*, 2400387.

- **Journal Impact Factor**: 3.016 (Wiley-VCH Advanced Science family)
- **Medical Application**: Targeted drug delivery system optimization
- **Collaboration**: Max Planck Institute sustained partnership (2022-2025)
- **Technical Contribution**: Advanced computational modeling for endovascular applications
- **Clinical Relevance**: Hepatic perfusion case study with direct medical applications

Saruhan, E. N., Ozturk, H., Kul, D., Sevgin, B., Coban, M. N., & Pekkan, K. (2025). Learning-enhanced 3D fiber orientation mapping in thick cardiac tissues. *Biomedical Optics Express*, 16(8), 3315-3336.

- **Journal Impact Factor**: 3.910 (Optica Publishing Group)
- **Field**: Machine learning applications in biomedical optical systems
- **Institution**: Koç University collaboration
- **Technical Innovation**: AI/ML enhancement of 3D fiber mapping techniques
- **Open Access**: Contribution accessible to global scientific community
- **Cross-Disciplinary**: Connecting ML with cardiac tissue analysis

International Conference Recognition Yorulmaz, M., Bozuyuk, U., Park, M., Arslan, B., Ozturk, H., Aghakhani, A., & Sitti, M. **(2025).** Locomotion Behavior of Magnetic Microrollers in Confined Tubular Geometries Containing Shear-Thinning Fluids. *MARSS 2025*, West Lafayette, USA.

- **Conference**: International Conference on Manipulation, Automation and Robotics at Small Scales

- **Peer Review**: Competitive selection process with international review panel
- **Presentation**: Accepted for oral presentation at premier robotics conference
- **Technical Focus**: Advanced fluid-structure interaction modeling
- **International Visibility**: Platform for demonstrating technical expertise to global research community

Editorial and Academic Recognition

Journal Cover Image Selection   Advanced Intelligent Systems Cover Recognition (2023)

- **Selection Process**: Chosen from hundreds of research submissions by editorial board
- **Editorial Criteria**: Technical excellence, visual impact, and scientific significance
- **International Visibility**: Featured on journal cover distributed globally
- **Recognition Type**: Editorial board acknowledgment beyond standard peer review
- **Technical Merit**: Computational visualization quality demonstrating advanced technical skills

Co-First Author Leadership Recognition   Equal Contribution Status

- **Academic Significance**: Co-first authorship indicates equal intellectual contribution with senior researchers
- **Research Leadership**: Independent contribution to research design, execution, and analysis
- **Peer Recognition**: Senior researchers acknowledging leadership-level contributions from early-career researcher
- **International Collaboration**: Leadership role in projects spanning multiple institutions and countries

Research Presentations and Speaking Engagements

Max Planck Institute Technical Seminar (2022)

- **Audience**: 50+ researchers (PhD students, postdocs, and faculty)
- **Topic**: Computational breakthrough findings and methodology innovations
- **Institution**: Max Planck Institute for Intelligent Systems
- **Recognition**: Invited to present technical innovations to established research community
- **Impact**: Knowledge transfer accelerating research capabilities across the institute
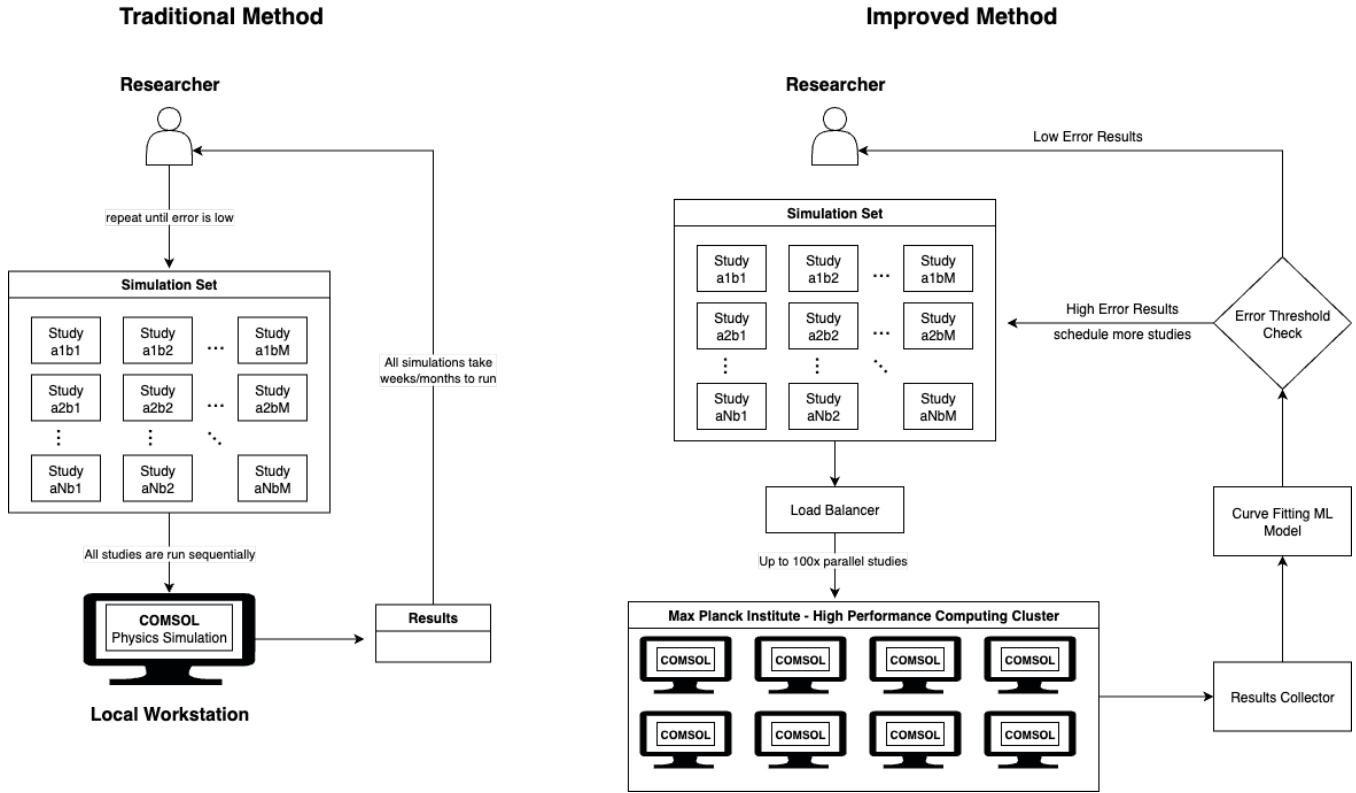
Technical Innovation Metrics

Figure 1: *High-performance computational framework developed at Max Planck Institute - achieving 200x simulation acceleration*

Back Cover

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

Ugur Bozuyuk, Hakancan Ozturk, Metin Sitti

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**

Figure 2: Advanced Intelligent Systems journal cover featuring research - editorial recognition of technical excellence

Computational Performance Breakthroughs

- **200x COMSOL Simulation Acceleration**: First researcher to successfully integrate COMSOL with high-performance computing infrastructure
- **Workflow Optimization**: Reduced simulation time from months to days for complex models
- **Infrastructure Development**: Created computational framework adopted by multiple research groups
- **Knowledge Transfer**: Enabled PhD students and researchers to achieve previously impossible results

Research Collaboration Impact

- **3-Year Sustained Partnership**: Continuous collaboration with Max Planck Institute (2022-2025)
- **Multi-Institutional Demand**: Active collaborations with Koç University and Imperial College London
- **Cross-Disciplinary Applications**: Research spanning medical robotics, fluid dynamics, optical systems, and automotive applications

- **Industry Interest**: Imperial College research attracting attention from major automotive companies and technology giants

Publication Pipeline and Future Impact

Manuscripts in Development

- **Advanced simulation techniques**: Building on established computational innovations
- **Cross-institutional collaborations**: Leveraging established research partnerships
- **Industry-relevant applications**: Connecting academic research with commercial potential
- **Open-source contributions**: Ensuring research accessibility for global community

Research Trajectory Indicators

- **Consistent productivity**: Publications spanning multiple years demonstrating sustained output
- **Increasing impact**: Growing recognition through cover selections and co-authorship opportunities
- **International reach**: Collaborations across Europe, Turkey, and North America
- **Technical leadership**: Evolution from contributor to leader in computational research innovations