

Zhao MA

LECTURER · COMPUTATIONAL DESIGNER · COMPUTER SCIENTIST · ENGINEER & ARCHITECT

Chair of Being Alive, ETH Zürich

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🎓 Education

Sep./2017–Sep./2020	ETH Zürich (Swiss Federal Institute of Technology) Ph.D. in Architecture and Technology (to recruiters: 90% computer science, but located in arch. department for Disney-ETH collaboration.) <i>Institute of Technology in Architecture</i>	Zürich, Switzerland
Sep./2013–Jun./2017	Massachusetts Institute of Technology (MIT) Master of Architecture <i>School of Architecture and Planning</i> Master of Engineering (High Performance Structure) <i>School of Civil & Environmental Engineering</i>	Cambridge, MA, US
Sep./2008–Jun./2012	Beihang University (Beijing University of Aeronautics and Astronautics) Bachelor of Engineering <i>Honors College School (School of Advanced Engineering) – Industrial Design</i> <i>Honors College School (School of Advanced Engineering) – Physics</i> Bachelor of Arts <i>School of Foreign Languages – English Literature</i>	Beijing, China

📖 Academic Experience

RESEARCH ASSOCIATE 02/2021–now	Chair of Being Alive • Developed Computational drawing system for environmental and biological system: root, tree, soil, etc.	ETH Zürich, Switzerland
PH.D. RESEARCHER 09/2017–08/2020	Disney Research Zürich • Developed a design & optimization system for fabricating large scale rebar frames with ABB robot. • Developed a design & optimization system for making clay sculpture with Universal Robot.	Zürich, Switzerland
RESEARCH ASSISTANT 04/2017–08/2017	MIT Media Lab • Developed origami-based fabric knitting simulation. • Developed geometric transformation rules for a specific type of linkage-structure.	MIT, Cambridge, MA, US
RESEARCH ASSISTANT 01/2016–03/2017	Web Development for Prof. Anne W. Spirn • Developed documentary website “Marnas” (MIT Library Funded). • Redeveloped various website for Prof. Anne W. Spirn.	MIT, Cambridge, MA, US
RESEARCH ASSISTANT 04/2015–06/2017	Digital Structure Group • Researched on Topological Interlocking System. • Researched on Drone-Based Additive Manufacturing (Casting & 3D printing).	MIT, Cambridge, MA, US
RESEARCHER 05/2015–08/2015	Block Research Group • Conducted a research on large deformation problems on elastic material. • Analysed the design strategy of Traversina bridge. • Implemented parametric graphic statics for Traversina bridge analysis.	ETH, Zürich, Switzerland
RESEARCH ASSISTANT	Free-Form Concrete Design & Fabrication	MIT, Cambridge, MA, US

06/2014-08/2014 | • Conducted an independent research on fabric formwork casting for Prof. John Fernandez.

REPRESENTATIVE | **2010 Asian Science Camp** | *Mumbai, India*
07/2010 | • Representative of China (1 of 22 undergraduate) in natural science subject.

Teaching Experience

LECTURER 06/2021-now	Master of Science in Landscape Architecture • Taught 061-0113-00L <i>Digital Design Methods I</i> .	<i>ETH, Zürich, Switzerland</i>
LECTURER 09/2018-12/2018	Master of Advanced Studies ETH in Architecture and Digital Fabrication • Taught computational methods and parametric tools for design synthesis.	<i>ETH, Zürich, Switzerland</i>
TEACHING ASSISTANT 09/2016-12/2016	4.215J/11.306 Sensing Place • Co-taught photography class with Prof. Anne W. Spirn. • Taught web development for personal photography website.	<i>MIT, Cambridge, MA, US</i>
TEACHING ASSISTANT 12/2015-01/2016	4.109 2016: The Architect's Foundry • Researched on and instructed aluminium casting, lost-foam casting.	<i>MIT, Cambridge, MA, US</i>
RPL ASSISTANT 02/2014-01/2016	Rapid Prototyping Lab • Conducted 3/4 axis CNC milling research. • Conduct general fabrication job and provide guidance for students.	<i>MIT, Cambridge, MA, US</i>

Working Experience

COMPUTATION CONSULTANT 10/2020-now	OPT Industries (Media Lab Startup) • Leading the design & implementation of general material design toolkit for material micro-structures. • Leading the design & implementation of specified material simulation toolkit for ongoing research projects.	<i>Boston, MA, US</i>
STRUCTURE CONSULTANT 06/2016-08/2016	Ferentinos Design • Conducted FEM structural analysis & optimization for lectern design.	<i>Boston, MA, US</i>
JUNIOR ARCHITECT 09/2012-06/2013	Tianjin Architecture Design Institute, Binhai • Cooperated with BIG as LDI on Rose Rock International Financial Centre. • Co-designed Information Centre in Tanggu, Tianjin.	<i>Tianjin, China</i>
INTERN ARCHITECT 05/2012-08/2012	WAX Studio • Renovated and designed Citizen Service Centre in Gu'an, Hebei Province. • Designed a new urban plan for Hotan, Xinjiang Province.	<i>Beijing, China</i>
DESIGN CONSULTANT 06/2011-07/2011	Beijing Always Flying Technology Co., Ltd. • Designed structure and visualized DB-1 UAV for Autodesk's <i>World Successful Cases</i> .	<i>Beijing, China</i>

Selected Honors & Awards

07/2021 | DigitalFUTURES 2021, 1 of 4 Recipients of YOUNG Award | *Shanghai, China*

08/2018	Honor Award for 2018 ASLA Professional Awards,	MIT, Cambridge, MA, US
04/2017	MIT Graduate School Leadership Fellow,	MIT, Cambridge, MA, US
05/2016	Marvin E.Goody Award,	MIT, Cambridge, MA, US
02/2016	Bill Mitchell Design Award,	MIT, Cambridge, MA, US
01/2016	Make Me++ Hackathon (DDI 2016), Top 1 winner	MIT, Cambridge, MA, US
12/2015	Harold Horowitz (1951) Student Research Fund,	MIT, Cambridge, MA, US
06/2015	Zeno Karl Schindler Foundation Grant,	ETH,Zürich, Switzerland
2013-2017	MIT Merit Scholarship (8 semester Tuition Grant),	MIT, Cambridge, MA, US
11/2011	Scholarship of scientific innovation, 1st Prize	Beihang Uni., Beijing, China
12/2008	Scholarship of excellent freshmen, 1st Prize	Beihang Uni., Beijing, China

Selected Publications

06/2021	Stylized Robotic Clay Sculpting Ma, Z., Duenser, S., Schumacher, C., Rust, R., Bächer M., Gramazio, F., Kohler, F., Coros, S., <i>Computers & Graphics</i> , 2021.
11/2020	RobotSculptor: Artist-Directed Robotic Sculpting of Clay Ma, Z., Duenser, S., Schumacher, C., Rust, R., Bächer M., Gramazio, F., Kohler, F., Coros, S., <i>Symposium of Computational Fabrication</i> , 2020.
06/2020	Designing Robotically-Constructed Metal Frame Structures Ma, Z., Walzer,A., Schumacher, C., Rust, R., Gramazio, F., Kohler, F., Bächer, M., <i>Computer Graphics Forum (Eurographics Special Issue)</i> , Vol:39-2, 2020.
08/2018	KinetiX – designing auxetic-inspired deformable material structures Ou, J., Ma, Z., Peters, J., Dai, S., Vlavianos, N., Ishii, H., <i>Computers & Graphics</i> , Vol:75, 72-81, 2018.
09/2016	Grammar-based Rhombic Polyhedral Multi-Directional Joints and Corresponding Lattices Ma, Z., Latteur, P., and Mueller, C., <i>Proceedings of the International Association for Shell and Spatial Structures (IASS) Symposium 2016</i> .
08/2015	Drone-Based Additive Manufacturing of Architectural Structures Lateur, P., Goessens, S., Breton, J.S., Leplat, J., Ma, Z. and Mueller, C., <i>Proceedings of the International Association for Shell and Spatial Structures (IASS) Symposium 2015</i> .
08/2011	Elasticity analogy of plane incompressible inviscid flows Ma Zhao, Jiang Chi-ping. <i>Mechanics in Engineering</i> , 2011, 33(4): 63-65.

Skills

Programming Language (orderly)

C++, Python, C#, Javascript, HTML, CSS

3 & 4-Axis Machining

Shobot 3 & 4 Router, Onsrud, OMAX WaterJET

Structural Analysis

Karamba, GSA

3D Printing

STL (FormLabs), PolyJet (Stratasys Connex Objet), Binder Jet (Z-Corp),
General FDM printer

3D modelling (orderly)

Rhino, Blender, ArchiCAD, SolidWorks

6-Axis Robot

Kuka KR Agilus, ABB IRB 4600, Universal Robot

General Manufacturing

Mould Fabrication, Sand Casting, Plastic Casting, Thermoforming,
Laser-cut

Languages

Chinese (Native), English

Thesis Advisory

06/2019-09/2019	Robotic Claygraphy Student: Ying-Shiuan Chen	Zürich, Switzerland
06/2018-09/2018	Rebar Assemblies: A framework for the generation of stress-aligned rebar layouts Student: Rafael Pastrana Jimenez Armando (<i>currently a Ph.D at Princeton Univ.</i>)	Zürich, Switzerland

Exhibitions & Invited Talks

07/2021	DigitalFUTURES 2021 Closing Ceremony Award Wining Talk	Online
06/2019	DESIGNLABOR: MATERIAL + TECHNIK	Museum für Gestaltung, Zürich