

Keith Janghyun Lee / Public CV

<i>Research Interests</i>	Structural demand analysis; quantification and reduction of design complexity; high-performance computational design; optimal assignment in structural design	
<i>Education</i>	Massachusetts Institute of Technology , Cambridge, USA <i>Department of Architecture</i> Doctor of Philosophy in Building Technology Present <ul style="list-style-type: none">- Dissertation: <i>The supply and demand of geometry and force</i>- Advisor: Professor Caitlin Mueller	
	McGill University , Montréal, Canada <i>Department of Civil Engineering and Applied Mechanics</i> Master of Engineering in Structural Engineering 2020 <ul style="list-style-type: none">- Thesis: <i>Moment-induced block shear failure in bolted flange plate connections</i>- Advisor: Professor Colin Rogers	
	Bachelor of Engineering in Civil Engineering 2018	
<i>Significant Awards</i>	National Science and Engineering Research Council of Canada <ul style="list-style-type: none">- Alexander Graham Bell Scholarship - Master's (CGS-M) 2019- Undergraduate Summer Research Award (USRA) 2018	
	McGill <ul style="list-style-type: none">- Engineering Undergraduate Student Master's Award (MEUSMA) 2018-2019- Hydro Québec Scholarship 2018-2019- Greville Smith Scholarship 2013-2017	
<i>Academic Experience</i>	MIT <i>Research Assistant</i> Present	
	McGill <i>Graduate Researcher</i> 2018-2020 <i>Undergraduate Researcher</i> 2016-2018	
<i>Teaching Experience</i>	MIT <i>Teaching Assistant</i> <ul style="list-style-type: none">- 4.450: Computational Structural Design and Optimization Present- 4.463: Building Technology Systems: Structures and Envelopes F2021- 4.462: Introduction to Structural Design S2021	
	<i>Co-Instructor</i> <ul style="list-style-type: none">- 4.S44: In Tension: The computational design, engineering, and fabrication of large scale sculptural rope networks S2023 with Caitlin Mueller, Adam Burke, Janet Echelman, Nicole Wang, and Alessandro Beghini	
	McGill <i>Teaching Assistant</i> <ul style="list-style-type: none">- CIVE318: Structural Engineering II S2019, S2020- CIVE385: Structural Steel and Timber Design for Architects F2018, F2019	

<i>Relevant Professional</i>	Eurovia BC, North Vancouver, Canada - Field Intern - Grader	2012-2013 2014
<i>Consultancy</i>	JJJfound Design Studio <i>Design Consultant: B/02 Bicycle</i>	2019-2020
<i>Publications</i>	K.J. Lee , R. Danhaive and C.T. Mueller, Spherical harmonic shape descriptors of nodal force demands for quantifying spatial truss connection complexity. Architecture, Structures and Construction, 2022	
<i>Conference Proceedings</i>	K.J. Lee , N.K. Hirt and C.T. Mueller Convergence of geometry and strength through the standardization of North American steel sections, 1873-present 8 th International Congress on Construction History, 2024	
	I. Donovan, J. Schnitzler, K.J. Lee , P. Wongsittikan, E. Liu and C.T. Mueller PixelFrame: A reconfigurable, precast, post-tensioned concrete structural system for a circular building economy International scientific conference on the Built Environment in Transition, 2023	
	A. Burke, K.J. Lee , J. Echelman, D. Feldman and C.T. Mueller FDMremote: Interactive inverse design of tensile structures with differentiable FDM International Association of Shell and Spatial Structures Annual Conference, 2023	
	K.J. Lee and C.T. Mueller, Adapting computational protein folding logic for growth-based, assembly driven spatial truss design. International Association of Shell and Spatial Structures Annual Conference, 2021	
<i>Other Publications</i>	K.J. Lee , A. Titova, C.T. Mueller and J. Ochsendorf, Achieving next-generation transportation infrastructure through lifecycle performance assessment, design excellence, and digital fabrication. <i>Policy Perspectives on Infrastructure 2021</i> MIT School of Architecture and Planning	
	K.J. Lee , Influence and compromise in post-war Korean architecture. <i>Imprint 02 2022</i> MIT Architecture	
<i>Presentations, talks, & workshops</i>	A differentiable assignment algorithm for high performance inventory-driven structural design (in)visible reuse Research Symposium, EPFL, Lausanne Switzerland	2023
	Introduction to the Finite Element Method: <i>how computers think about buildings and how you can think about them too</i> MIT Architecture, 4.450 Lecture, Cambridge USA	2022
	(Non-Euclidean) directional centroid clustering of building load demands MIT Climate & Sustainability Consortium Symposium Data Workshop, Cambridge USA	2022
	PixelFrame: concrete structures against obsolescence MIT Climate & Sustainability Consortium Symposium, Cambridge USA	2022
	Reducing embodied energy with novel building structures Groupe Bouygues, MIT ILP, Cambridge USA	2022

	The similarity of forces in equilibrium: a geometric approach Foster + Partners, London UK	2022
	Structural steel design MIT Architecture, 4.463 Lecture, Cambridge USA	2022, 2021
	Spherical harmonic shape descriptors of nodal force demands... 5 th International Conference on Structures & Architecture, Aalborg DK	2022
	Adapting computational protein folding logic... International Association of Shell and Spatial Structures Annual Conference, Surrey UK (virtual)	2021
	Complexity & similarity in structural design MIT Architecture, SMArchS Colloquium, Cambridge USA	2021
<i>Service</i>	Stride into STEM: Generative Structural Design Altair, Instructor, Boston USA	2022
	Engineering Independence: Concrete Architecture in the Global South MIT Architecture, symposium organizer, Cambridge USA	2021
<i>Skills/ Knowledge Base</i>	Languages - English (Native), French (Conversational), Korean (Conversational)	
	Software/Programming - Julia, C#, Python, Rhino/Grasshopper (+Karamaba, +Wasp), Abaqus/CAE, L ^A T _E X, Illustrator	
	Structural Laboratory/Construction - Hydraulic actuators/controllers (MTS), LVDTs, string potentiometers, strain gauges, DAQ systems (StrainSmart, MTS), general powered/non-powered construction equipment - Qualifications: ASP construction safety, forklift operation, bridge crane operation, working at heights, WHMIS	
<i>Open Source</i>	Asap.jl / AsapToolkit.jl / AsapOptim.jl (another) <i>Structural Analysis Package</i>	
	FDMremote.jl / FDMremote <i>Force Density Method (Remote)</i>	

Last updated: August 26, 2023