CURRICULUM VITAE

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Education:

2020	Doctor of Philosophy, Faculty of Architecture, BME, Budapest /*The role of geometry in the structural behaviour of masonry arches and domes, supervisor: Professor István Sajtos*/
2010	MSc in Architecture, Faculty of Architecture, BME, Budapest (2006, Erasmus, NTNU Norway, 2007, Exchange program, TU Wien)

SCIENTIFIC ACTIVITY

Work experience:

2023-	Incoming Assistant Professor, Department of Architecture, College of Arts and Architecture, Pennsylvania State University
2020-2023	Assistant Professor, Department of Mechanics, Materials and Solids, Faculty of Architecture, BME, Budapest
2017-2020	Assistant Lecturer, Department of Mechanics, Materials and Solids, Faculty of Architecture, BME, Budapest

Mobility and Research grants (individual):

2023	Seal of Excellence (87,5%) MSCA Postdoctoral Fellowships (*UN-CUT - HORIZON-MSCA-2022-PF-01*) – Marie Skłodowska-Curie Actions (unfunded)
2022-2023	Korányi Fellowship (Thomas Cholnoky Foundation) Visiting Fellow at the Form Finding Lab, Department of Civil and Environmental Engineering, Princeton University, US /*Design and analysis of self-locking patterns for masonry vaults*/
2021-2022	Post-doctoral Research Grant (ÚNKP-21-4-II-BME-181) by: New National Excellence Program of the Ministry for Innovation and Technology (NKFIH) /*Optimal triangulation of braced domes*/
2019-2020	PhD candidate Research Grant (ÚNKP-19-3-III-BME-78) by: New National Excellence Program of the Ministry for Innovation and Technology (NKFIH) /*Optimization of dome geometry - the original subdivision concept of the 1st Zeiss Planetarium in Jena*/ - selected as exemplary project by the funding scheme (university level) https://tinyurl.com/muufv46b
2017	Short training work stay (EGT-Norway-M2) by: EEA Grants /Faculty of Architecture, NTNU Trondheim –/*Early developments in Nordic reinforced concrete shell architecture*/

2016	Young National Talent Grant by: National Talent Program /*History of Hungarian shell architecture*/
2016-2017	Postgraduate Research Grant by: National Cultural Fund of Hungary /*In Candela's shadow - Hypar shell architecture in Hungary*/
2015-2016	Postgraduate Research Grant by: National Cultural Fund of Hungary /*Frozen modernity - Heyday of Hungarian shell architecture*/

Research grants and other funding (project):

2021-2024	RECube ERASMUS+ project, associated partner (BME) (member)
2017-2021	OTKA research grant (K-124859), researcher by: the Hungarian Ministry for Innovation and Technology /*Mechanics of no-tension masonry structures*/(PI: Dr. István Sajtos)
2018-2021	BME FIKP-VIZ (VIZ_11), researcher by: Higher Education Excellence Program of the Hungarian Ministry of Human Capacities /*Seismic retrofit of monuments and structures* /
2015	Sponsoring of the joint-exhibitions „*Pier Luigi Nervi*" – „*Architecture as Challenge and Frozen Modernity*", co-organizer, curator – responsible for obtaining and managing the grant for the latter by: National Cultural Fund (NCFH) of Hungary
2014	Sponsoring of the workshop '*The legend of the sunken concrete ship near Ásványráró*', coordinator, responsible for obtaining and managing the grant by: MMA (Hungarian Academy of Fine Arts)

Awards:

2021	Pro Progressio Award for Innovation: *Development of the geometry of a masonry building block*. R&D with the company Wienerberger (team member)

Publications:

Type	Year	Publication	Nr of citations (ind.) // Journal ranking	Scientific significance
research article	2023	Gáspár, O., Kis, A. É.: The invisible beauty of the Zeiss-Dywidag domes: topology optimization of the triangulated rebar grids. *International Journal of Architectural Heritage 1-22.* DOI: 10.1080/15583058.2023.2217659	-// Q1 (Arch)	*Explains the evolution of the rebar grid of Zeiss-Dywidag domes. Reveals Baursfeld's motivation to abandon his highly optimized first design, and shows the relevance of his unpublished contribution to the theory of equivalent continuum analysis of grid shells.*
	2022	Gáspár, O., Sajtos, I., & Sipos, A. A.. Multi-Hinge Failure Mechanisms of Masonry Arches Subject to Self-Weight as Derived from Minimum Thickness Analysis. *International Journal of Architectural Heritage*, 1-29. DOI: 10.1080/15583058.2022.2084702	- // Q1 (Arch)	*Proves for the first time that failure mode does not only depend on the arch geometry but also stereotomy. Shows that historical architecture prefers ‚good enough' over highly optimized geometry. Interconnects results from archaeology and mechanics.*
	2022	Gáspár , O. The optimization process leading to the tessellation of the first geodesic dome structure, the first Planetarium of Jena, *International Journal of Space Structures*, 37(1), pp.49-64 DOI: 10.1177/09560599211064110	- // Q2 (Arch) Q2 (Cons)	*Uncovers that the subdivision of the first ever built geodesic dome structure is based on the concept of equal-area triangulation of the sphere. Results are of theoretical interest to multiple disciplines from geography to chemistry.*
	2021	Gáspár, O., Sajtos, I., Sipos, A.A. Friction as a geometric constraint on stereotomy in the minimum thickness analysis of circular and elliptical masonry arches. *International Journal of Solids and Structures*, 225, p.111056. DOI: 10.1016/j.ijsolstr.2021.111056	3(2) // Q1 (Mech. Mat)	*Extends the results of (Gaspar et al, 2018) and makes it accessible for practice: It concludes that only stereotomies close to ‚regular' (radial) have true relevance, as frictional failure heavily constrains the admissible geometries.*
	2018	Gáspár, O., Sipos, A.A.,Sajtos, I. Effect of stereotomy on the lower bound value of minimum thickness of semi-circular masonry arches. *International Journal of Architectural Heritage*, 12(6), pp.899-921. DOI: 10.1080/15583058.2017.1422572	27(21) // D1 (Arch)	*Relying on stereotomy, the novel geometric methodology introduced turns the minimum thickness analysis into a constrained optimization problem. Beside the theoretical relevance, results can be implemented into computational design tools.*

	2017	Gáspár, O., Sajtos, I. The economy of the exotic: The relation of shell architecture and industrialization in Hungary between 1949–1970. *Építés-Építészettudomány*, 45(1-2), pp.91-116. DOI: 10.1556/096.2017.45.1–2.2	1(0) // Q2 (Arch)	*Showcases and contextualizes Hungarian shell architecture within the international trends. It is filling a knowledge gap in the history of construction.*
	2013	Gáspár, O.,Sajtos, I. Az erőjáték és az anyagtulajdonságok hatása a téralakításra. / *Power of Form. Form finding methods. (In Hungarian). Építés-Építészettudomány*, 41(1-2), pp.67-113. DOI: 10.1556/eptud.41.2013.1-2.4	1(1) // Q3 (Arch)	*Review article on various form-finding methods – most of them have not been presented in Hungarian before. Dissemination of the state-of-the-art on the national level.*
book chapter	2023	Haba P., Gáspár O.: Finding Nervi: On-site pre-casting in the Hungarian industrial architecture. In: Moravánszky Á., Skanski, L., C Deambrosis, F. (eds) *Cold War Interactions (to be published)*		
	2023	Gáspár O. Adriaenssens, S. (2023) Structures of Zalotay's Utopia. In: Joanelly, T., Annen, M. (eds), *Elemér Zalotay. Manic Modern (to be published)*		
conference papers	2023	Gáspár, O., Olivieri, C., Paris, V., Adriaenssens, S.: Experimental and numerical investigation of the internal force distribution of a pitched brick barrel vault in different construction phases. In *Proceedings of the 4CIHCLB, Guimares*		
	2022	Gáspár, O., Kis, A. É.: Searching for the engineering optimum: evolution of the topology of the triangulated rebar grid of the Zeiss-Dywidag domes. In *Proceedings of the IASS/APCS 2022 Annual Symposium, Beijing*		
	2022	Ackermann, Á., Gáspár, O. Parametric design tool for frameworks with minimal rigidity condition. In *Proceedings for the 14th Computational Structures Conference, Montpellier*		
	2021	Gáspár, O., Sajtos, I.,Sipos, A.A. Safe estimation of minimum thickness of circular masonry arches considering stereotomy and different rotational failure modes. In *Proceedings of the 12th International Conference on Structural Analysis of Historical Construction*, ed. P. Roca, L. Pela, C. Molins, Barcelona		
	2021	Sajtos, I., Gáspár, O., Sipos, A.A.General Thrust Surface of the Masonry Domes. In *Proceedings of the 12th International Conference on Structural Analysis of Historical Construction*, ed. P. Roca, L. Pela, C. Molins, Barcelona		
	2021 *(cited)*	Gáspár, O. Bauersfeld's concept for the subdivision of the first built geodesic dome structure. In *Proceedings of the IASS Annual Symposium and Spatial Structures Conference 2020/21*, Surrey. cited by 4(3)		
	2019	Gáspár, O., Sajtos I.,Sipos A.A. The role of rotational collapse mode and catenary-type thrust lines in the limit state analysis of masonry arches. *In Proceedings of the IASS Annual Symposium 2019*, ed: C. Lázaro, K.-U. Bletzinger, E. Oñate, Barcelona		
	2019	Sajtos, I., Gáspár, O., Sipos, A. A. Geometry of the crack-free spherical masonry dome. In Proceedings of the IASS Annual Symposium 2019, ed: C. Lázaro, K.-U. Bletzinger, E. Oñate, Barcelona		
	2018	Gáspár, O., Sipos, A. A., Sajtos, I. Stereotomy related studies considering the effect of limited angle of friction on minimum thickness values for semi-circular masonry arches. In Proceedings of the 8th ICBR Conference, Lisbon		
	2017	Gáspár, O., Sajtos, I. Lower bound of the minimum thickness values for circular masonry arches based on thrust line analysis considering various stereotomies. In *Proceedings of the IASS Annual Symposium 2017"Interfaces: architecture.engineering.science"*, ed. A. Bögle, M. Grohmann, Hamburg.		
	2017	Mándoki, R., Gáspár, O. Shell roofing of the KÖFÉM Factory – historical case study on the effect of geometrical imperfection. In *Proceedings of the IASS Annual Symposium 2017"Interfaces: architecture.engineering.science"*, ed. A. Bögle, M. Grohmann, Hamburg.		
	2016	Gáspár,O., Sajtos, I. On the definition of the line of thrust. In *Structural Analysis of Historical Constructions: Anamnesis, Diagnosis, Therapy, Controls: Proceedings of the 10th International Conference on Structural Analysis of Historical Constructions*, ed. K. Van Balen, E.Verstrynge, 1003-1010.Boca Raton, FL: CRC Press.		
	2016	Gáspár, O.,Sajtos, I., Parallel Universe–Evolution of Hungarian Shell Architecture. In *Proceedings of IASS Annual Symposia* (Vol. 2016, No. 12, pp. 1-10). International Association for Shell and Spatial Structures (IASS)		
book	2022	Hegyi D. Gáspár, O., Fehér E. *Special Loadbearing structures // Különleges tartószerkezetek* (billingual) Budapest, Hungary: TERC Zrt. ISBN: 9786155445903 https://tinyurl.com/3tp22s7x		

Reviewer: International Journal of Architectural Heritage, International Journal of Solids and Structures, Masonry Research and Innovation, Journal of Computational Design and Engineering, Royal Society Open Science

Invited speaker/contributor:

2023 March	*'Structures and Patterns'* DigitalFUTURES 10th Edition, Department of Architecture, Tongji University (*https://www.youtube.com/watch?v=LgDbzcvPKwk*)
2022 December	*'Ventures into structural geometry'* CEE Seminar Series – Fall 2022, Dept. of Civil and Environmental Engineering, Princeton University
2022 June	'*Finding Nervi: On-site pre-casting in the Hungarian industrial architecture.* Cold War Interactions - Workshop, Politecnico di Milano (with Péter Haba)
2021 October	'*Shell architecture*' XXX. Conference of Preservation of Monuments, ICOMOS, Hungarian National Committee, Salgótarján
2016 June	'*Hungarian shell architecture*' Symposium of the Hungarian Group of fib, Budapest
2016 June	'*Nervi Project //Frozen Modernity*' Pecha Kucha Night Budapest vol.49, Budapest

2016 April	'*Frozen Modernity – The heyday of Hungarian Shell Architecture*' Utopias and Realities Conference, Berlin(https://youtu.be/T4OcJ_IAius)

Service:

Design Studio guest critic at the University of Pennsylvania (2023)

co-organizer of the exhibition '*Balancing Act*' (Sigrid Adriaenssens) (2023, Raleigh, NC)

co-organizer of the joint-exhibitions *'Pier Luigi Nervi– Architecture as Challenge'* and *'Frozen Modernity*', and curator of the latter (2016, Budapest)

regularly organizes and holds popular science presentations (Researcher's Night, Celebrating Hungarian Science)

Membership: member of the International Association for Shell and Spatial Structures (IASS)

PROFESSIONAL ACTIVITY

Work experience:

2011-	freelance architect (*collaborations include Studio Konstella, András Huszár, Budapest*)
2010-2012	architect, project manager (*KrüllUng Kft, Budapest*)
2007-2010	junior architect (*3H Architects, Budapest*)

Licence & Membership: Licensed architect in Hungary, member of the Budapest Chamber of Architects

EDUCATIONAL ACTIVITY

Teaching:

Since 2022	*Architectural Design Graduate Studio*, Studio Head for Deployable Structures, BME Faculty of Architecture (BME-FA)
Since 2017	*Special Loadbearing Structures* (course coordinator, instructor, co-lecturer with Dezső Hegyi –in English and Hungarian), BME-FA*
Since 2019	*Structures for Architecture Design Studio TT1* (co-lecturer, Studio Head), BME-FA (with Tamás Ther)
2016-2019	*Introduction to Structural Design* (course coordinator), BME-FA
Since 2016	Tutor for the structural concept development of *Diploma*, *Architectural Design Graduate and Undergraduate Studio* projects (both in English and Hungarian), BME-FA
Since 2013	*Statics, Strength of Materials I-II.,* and *Design of Loadbearing Structures* (instructor), BME-FA

*: Courses on mechanics and structural design comprise classes/labs (taught by instructors) and lectures. The course coordinator is responsible for the preparation of the course material and oversees the examination.

Advisor of graduate students:

advisor for TDK (2015 – ongoing) (*Student Scientific Research Conference*, a competitive scheme for individual student research projects, *multiple award winning entries(1st(1), 3rd(2), distinctions(2)), domestic and international publications (4)*

advisor for Architectural Research Project (2018-2020) – in English (3 students)

Mentoring activity: (undergraduate students) Student Teaching Assistants (group mentoring + mentoring in teaching and course development), workshops

Examination: *Global Exam in Structures* – organizer, committee member since 2016
Diploma Final Jury - committee member, since 2021

Student evaluation: consistently rated above 90%, 6th highest score in the Faculty of Architecture (BME) in Spring 2022 (top 5%, with a rate above 95%)

Awards:

2016	*Dean's Laudation for the Frozen Modernity Project* – BME-FA

Course enhancement / Teaching seminars:

2022	Development of two new courses as co-lecturer: *Graphic Statics* and *Sustainable Conceptual Design of Structures*, BME-FA (with Tamás Ther and István Sajtos)
2021	Participation at the teaching seminar organized by the *Hungarian Association of Educators in Mechanics* (MOHR), presenter at the Annual Symposium. '*How flipped a classroom can be*?' (with Anikó Pluzsik and Eszter Fehér)
2020 -	*Global Exam in Structures* - framework and implementation of digital two-part exams based on the Moodle learning platform, BME-FA
2020-2021	*Special Loadbearing Structures* - online teaching (COVID) methodology and its implementation, online course materials. Introduction of the flipped classroom concept to offline classes (Autumn 2021) BME-FA

Extracurricular activity:

2020	Researcher's Night, BME Department of Mechanics, Materials and Structures - co-organizer / '*Where do balloons go*?'/ (online event)
2013-	Concrete Canoe student workshop – coordinator Participation in the Hungarian Concrete Canoe Championship with the team of the BME Department of Mechanics, Materials and Structures (Best Looking Canoe, 2013, Gold medal 2014, Silver medal 2016 (plus Lightest in Show), Best Canoe 2017, Most Innovative Canoe 2018)
2016	Researcher's Night, BME Department of Mechanics, Materials and Structures - co-organizer / '*Concrete can flow*'/ Celebrating Hungarian Science, BME-FA
2015	Art or science? - symposium, speaker /'*How to parametrize a canoe?*'/
2015	Project Week, BME Faculty of Architecture, student workshop, organizer /*Frozen Modernity – documentation and modelling of the Hungarian reinforced concrete architecture*/
2014	'*Legend of the sunken concrete ship*' workshop for post graduate students – co-organizer. Joint project with the Doctoral School of Architectural Design, Ásványráró, Hungary

Service/appointments:

2021-	Deputy Head of the Department of Mechanics, Materials and Solids, BME
2021-2022	member, inter-departmental committee for the curriculum development for the newly introduced Structures and Geometry focus area
2021	Department Coordinator and member of the Faculty Committee of the Student Scientific Research Competition (TDK), BME-FA
2021-	Member of the Faculty Committee for Course Transfer, BME-FA
2021	Women in academia mentorship program, BME, consulting Department Advisor
2018-2019	member, Advisory Board on Teaching Practices, Future Strategies 2020, BME-FA

Communication activities and media appearance:

2021	https://sztwp.szt.bme.hu/intro_chaplin-2/ *Design and implementation (with Eszter Fehér and Tamás Ther) of the new website for the Department of Mechanics, Materials and Structures, BME-FA*
2013-2020	http://betonkenu.blogspot.com/ *blog showing photos, videos and collecting media appearances related to the concrete canoe team.* retrieved: 08.09.2022

2016	Építészfórum: 'Nervi projekt: Architecture as challenge.' https://epiteszforum.hu/nervi-projekt-architecture-as-challenge *report on the Nervi-exhibition at the most popular Hungarian architecture website* retrieved: 18.10.2021
2015-2018	nerviprojekt.hu and http://nerviprojekt.tumblr.com/ *blog showcasing the research work behind the 'Frozen Modernity' exhibition. Terminated. Example of posts can be found here: https://tinyurl.com/mrxdemwj* retrieved: 08.09.2022
2014	Építészfórum: 'A betonhajó legendája' /'Legend of the concrete ship'/ https://epiteszforum.hu/a-betonhajo-legendaja *report on a post-graduate student workshop* retrieved: 18.10.2021
2014	Építészfórum: 'Betonkenu két kézzel' / 'DIY concrete canoe'/ https://epiteszforum.hu/betonkenu-ket-kezzel retrieved: 18.10.2021 *report on the first successfully built concrete canoe*