



Call for Participation:

2022 Belt and Road International Student Competition on Digital Architectural Design

With the aim to promote the academic and cultural exchanges among university students from various countries, and to cultivate the scientific and technological innovation spirits and practical abilities of university students, the 2022 Belt and Road International Student Competition on Digital Architectural Design is expected to be launched.

The details are notified as follows:

I. Background

Two thousand years ago, in the vast desert, merchants from various countries led their camel caravans proceeding along the long Silk Road with tinkles of the camel bells incessantly lingering on, which facilitated the communication between China and the West. Nowadays, a modern railway transport network has been built on the ancient Silk Road where the speeding trains have become a new bond among countries along the route, accelerating the economic cooperation and cultural exchanges of all these countries. Despite the severe COVID-19 pandemic, the concept of a community with a shared future for mankind that advocates mutual help has been conveyed to the whole world, injecting new vitality to the ancient Silk Road.



Camel bells once lingered in the air, and merchant vessels used to come in a steady stream. Covering traffic hubs of the cities, the winding railway lines play a critical role in promoting the social and economic development of countries along the Belt and Road, for the network accelerates the flow of supplies and passengers. At present, the ongoing trend of digitalization highlights that it is important and pressing to develop, update, and operate digitalized and informatized railways and relevant facilities. In this context, the Belt and Road Architectural University International Consortium (BRAUIC) proposes to organize the 2022 Belt and Road International Student Competition on Digital Architectural Design themed on “Railway: A New Bond Along the Silk Road” with a view to cultivate all college students’ digitalization-based thinking that explores how to preserve the historical features of railways and cities, improve overall quality, and achieve sustainable development along the Silk Road. Urban renewal, architectural heritage protection, environmental monitoring, and other topics related to the railways are included in the Competition. Centering around these topics, participants will use computer-assisted technology, virtual reality, digital twins, geographic information system, remote sensing technology, and other new technologies to finish architectural design, structural design, and scene modelling and visualization. During the Competition, students’ comprehensive ability to solve problems will be improved. Their innovation capability will be demonstrated and quality in all aspects will be enhanced. Furthermore, this competition can play an active part in promoting the in-depth communication, cooperation, and sharing of BRAUIC members in the fields of



education, science, and culture.

II. Organizational structure

Initiated by:

- Belt and Road Architectural University International Consortium (BRAUIC)

Organized and hosted by:

- Beijing University of Civil Engineering and Architecture (BUCEA)

Co-organized by:

- Beijing International Peace Culture Foundation

Supported by:

- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- G-global International Secretariat
- International Society for Photogrammetry and Remote Sensing (ISPRS)
- Beijing Peace Garden Museum
- China Enterprise Culture Improvement Association
- Belt and Road Logistics Branch of China Communications and Transportation Association
- China Silk Road Group Limited
- Glodon Company Limited
- China Railway Design Corporation
- Beijing Jianda Assets Management Co., Ltd.



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- China International GeoInformation Corporation Limited
- Daspatial Technology Co., Ltd.

Featured Support by:

- China Architecture Design Group Land-based Rationalism D. R. C
- Beijing Advanced Innovation Center for Future Urban Design





III. Scientific Committee

Categories	Scientific Committee	Members
Architectural Design	Honorary Member	<ul style="list-style-type: none"> • Cui Kai, Academician of Chinese Academy of Engineering and National Master of Engineering Survey and Design
	Executive Member	<ul style="list-style-type: none"> • Zhang Jie, Tsinghua University & Beijing University of Civil Engineering and Architecture, China
	Members (In alphabetical order)	<ul style="list-style-type: none"> • Armen Shatvoryan, National University of Architecture and Construction of Armenia • Dong Lili, Chongqing Jiaotong University, China • Jin Qiuye, Beijing University of Civil Engineering and Architecture, China • Luca Maria Francesco Fabris, Politecnico di Milano, Italy • Marchwinski Janusz, University of Ecology and Management in Warsaw, Poland • Valerija Kopilas, University of Mostar, Bosnia and Herzegovina



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Structural Design	Honorary Member	<ul style="list-style-type: none"> • JIA Junbo, Elected Member of Norwegian Academy of Technological Sciences, and Engineering Expert at Aker Solutions, Norway
	Executive Member	<ul style="list-style-type: none"> • David Tann, University of East London, the UK
	Members (In alphabetical order)	<ul style="list-style-type: none"> • Guo Tong, Southeast University, China • Liu Zhongxian, Tianjin Chengjian University, China • Qi Jilin, Beijing University of Civil Engineering and Architecture, China • Shi Qingxuan, Xi'an University of Architecture and Technology, China • Vladimir Filatov, Moscow State University of Civil Engineering, Russia • WANG Bo, Jilin Jianzhu University, China
Scene Modelling and Visualization	Honorary Member	<ul style="list-style-type: none"> • Sisi Zlatanova, SHARP (Strategic Hires and Retention Pathways) Professor at the University of New South Wales, Head of the Geospatial Research, Innovation and Development lab, and President of Technical Commission IV 'Spatial Information Science' of the International Society for Photogrammetry and Remote Sensing (ISPRS)

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E-mail: brauic@163.com

Website: brauic.bucea.edu.cn



“一带一路”建筑类大学国际联盟

Belt and Road Architectural University
International Consortium

	Executive Member	<ul style="list-style-type: none">• Wu Huayi, Wuhan University, China
	Members (In alphabetical order)	<ul style="list-style-type: none">• Huang Guanwen, Chang' an University, China• Hu Han, Southwest Jiaotong University, China• Julien CHAMOIN, Junia Graduate School of Engineering, France• Kang Zhizhong, China University of Geosciences, Beijing, China• Liu Xianglei, Beijing University of Civil Engineering and Architecture, China• Miro Govedarica, University of Novi Sad, Serbia

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Website: brauic.bucea.edu.cn



IV. Eligibility

Open to both graduate and undergraduate students enrolled in engineering programs.

V. Categories and guidelines

Under the theme of *Railway: A New Bond Along the Silk Road*, centering around construction and management of railways and facilities, urban renewal, architectural heritage protection, environmental monitoring, and other topics, participants will use computer-assisted technology, virtual reality, digital twins, geographic information system, remote sensing technology, and other new technologies to finish architectural design, structural design, and scene modelling and visualization.

The 3 categories of the competition are:

- Category A: Architectural Design;
- Category B: Structural Design;
- Category C: Scene Modelling and Visualization.

See the *Annex 1: Competition Guidelines* for the specific requirements.

VI. Entry requirements

(1) Each participating university recommends no more than 6 teams with no more than 2 teams under each category.

(2) A participating team contains no more than 5 members and no more than 2 supervisors. The supervisors shall be university teachers.



(3) The submissions shall not contain any words or patterns indicating the names of the participants or the university. Those who do not meet the requirements will be disqualified.

(4) The participants have the copyright of the entries, while the organizers have the right to exercise other copyright except the authorship of the entries, including the right to use the entries (without additional payment), and retain the right of post-processing of the entries, such as publishing books, photo albums, videos, model exhibitions, and technology promotion, etc.

(5) It is strictly prohibited to copy the existing design works. The participants shall be responsible for the similarity, plagiarism, and intellectual property disputes of the technical solutions.

(6) Submitted entries will not be returned.

(7) All submitted materials shall be in English.

VII. Registration

(I) Sign-up

1. Deadline: May 20, 2022

2. Please send the *Work Recommendation Form* (See Annex 2-1) to brauic@163.com with the email title of “university name + 2022 BRAUIC Competition Sign-up”.

(II) Work submission



1. Deadline: July 29, 2022

2. Submission:

Please send the *Entry Information Form (Annex 2-2)* and work materials to brauic@163.com with the email title of “university name + 2022 BRAUIC Competition Work Submission”. For each recommended work, you shall include drawings and relevant documents with the file title of “university name + work name + first author’s name”.

Considering the difficulties in sending large files via email, you’re suggested to share the work documents through WeTransfer, and fill the WeTransfer Link in the *Entry Information Form*.

VIII. Schedule

S. N.	Time	Arrangement
1	March- April, 2022	Call for participation
2	April-May, 2022	Competition Sign-up
3	June-July, 2022	Work Submission
4	August-September, 2022	Jury selection
5	October 2022	Award ceremony & work exhibition (5th Anniversary Celebration of BRAUIC)



IX. Awards

S.N.	Category	Awards	No. of Winners	Prizes	Remarks
1	Architectural Design	The First Prize	1	15000 yuan, Trophy & Certificate	There are other awards such as Organizational Achievement Award and Outstanding Supervisor Awards. Excellent works will be selected for the exhibition. The Jury Committee may add or omit any prizes according to the quality of the submissions.
		The Second Prize	2	10000 yuan, Trophy & Certificate	
		The Third Prize	7	5000 yuan, Trophy & Certificate	
		Honorable Mentions	10	Certificate	
2	Structural Design	The First Prize	1	15000 yuan, Trophy & Certificate	
		The Second Prize	2	10000 yuan, Trophy & Certificate	
		The Third Prize	7	5000 yuan, Trophy & Certificate	
		Honorable Mentions	10	Certificate	
		The Second Prize	2	10000 yuan, Trophy & Certificate	
		The Third Prize	7	5000 yuan, Trophy & Certificate	
3	Scene Modelling and Visualization	The First Prize	1	15000 yuan, GET3D Cluster V5.0 (Software Value: 198000 yuan), Trophy & Certificate	



S.N.	Category	Awards	No. of Winners	Prizes	Remarks
		The Second Prize	2	10000 yuan, ModelPainter 4.0 (Software Value: 98000 yuan), Trophy & Certificate	
		The Third Prize	7	5000 yuan, ModelFun V2.1 (Software Value: 59800 yuan), Trophy & Certificate	
		Honorable Mentions	10	Certificate	

X. Welfare opportunities

1. Media coverage of the stories of university students from various countries participating at the Competition.
2. For international students who are not Chinese citizens and have won the First Prize, Beijing University of Civil Engineering and Architecture will award him/her International Students Freshman Scholarship for English-taught Master's Programs.
3. For universities winning the Organizational Achievement Award, Beijing University of Civil Engineering and Architecture will offer BUCEA International Summer School Scholarship (tuition-free) to one student from each winning university to participate the 2022 BUCEA International Summer School.
4. Other opportunities provided by member universities.



XI. Contact information

The Secretariat of the organizing committee is set at the Beijing University of Civil Engineering and Architecture.

Contact Information: Ms. LIU Lu, Ms. LI Yang

Tel: 0086-10-68324024, 0086-10-68327443

E-mail: brauic@163.com

Address: No.1 Zhanlanguan Road, Xicheng District, Beijing, P.R.China
100044

The Secretariat of the BRAUIC

April 20, 2022



Annex 1: Competition Guidelines

Category A: Architectural Design

I. Design requirements

1. You shall choose a town or village near a railway, and design a railway station building.
2. Your design shall be based on a real-life site and its current conditions.
3. The design shall include the following spaces to fulfill the respective functions: passenger service, tickets counter, waiting area, entrance and exit and supporting services (station affairs offices, bathrooms, etc.). The combination or integration mode of the functional spaces is at your discretion, but make sure it complies with the logic and rules of railway station operation.
4. Besides the passenger transportation function, you shall also fully consider the local social, economic, and cultural needs. You shall propose strategies to improve the passenger station building and its surrounding city, town or village, and make a corresponding design.
5. The railway station building shall be designed as Class-4 (see *China Railway Station Classification Method* in the notes below). The area of the building shall be in the range of 3,000 to 4,000 m², which can be properly adjusted to meet your needs and shall be explained accordingly.



6. You will only need to consider the station building's location in relation to the railway, adjacent or passing through. Factors related to the traffic plan and railway running shall not to be evaluated in the competition.

II. Entry requirements

1. Submit the following drawings: a floor plan, elevations, plans & sections, perspectives drawn to scale, and additional drawings that you find necessary to demonstrate the design philosophy and strategy; a 200-word project concept description in Chinese or English.

2. The above drawings and design instructions shall be presented in 2 drawings with A1 size (841mm x 594mm) and in vertical composition. There is no limit to the representation method of the drawings.

***Notes:** As *China Railway Station Classification Method* states, comprehensive railway stations that involve passenger transport, goods transport or goods train break-up and formation operations and meet at least two of the following three requirements are perceived as Class-3 station:

- Daily passengers who board, get off the trains and transfer at the station being 2000 or above, and luggage and packages that are delivered or transferred being 100 pieces or above;
- Daily loading and unloading 50 trains or above;
- Daily engaged in shunting operation for 500 trains or above.

Category B: Structural Design

I. Design Requirements

1. General requirements: This is an open-ended design exercise to encourage



well considered, innovative and creative solutions. Firstly, please describe the reasons for selecting the geographic location and the actual construction site of the railway bridge, and its role in the local political, economic and cultural landscape. Briefly describe the design philosophy or principles applied to this bridge. Up to 500 words for this section please. All design parameters including load and site conditions are to be determined by the participants. These should include the bridge's design capacity, topography of the site, its groundwater, geological, geotechnical conditions as well as any potential long-term impact that the local climate change or earthquake history would have on the bridge's structural performance. The technical design standards to be used, the design load and all other relevant site conditions, are to be specified by the participants and should be clearly presented in the design scheme with narratives. Please use tabular form or sketches to illustrate where necessary. Participants are encouraged to propose novel and reasonable bridge structure types.

2. Bridge type: Railway bridge. According to the demands of the countries or districts where the participants are located, the design work can be carried out on a single bridge or bridge group in the selected railway line. According to the specific conditions of the selected railway line, there is no limit to the type of the bridge crossing barriers, including rivers, roads, and valleys, etc.

3. Scale of the Bridge: the bridge length and span combination shall be determined by the designers to ensure it is fit for purpose and meets the design



requirements for the selected railway line. The bridge width shall be designed according to the standard of double track railway.

4. Requirements for bridge types and design contents are as follows:

(1) Bridge types: Suspension, Cable-stayed, Arch bridge, Beam bridge, Truss bridge or combined, mixed, new conceptual, futuristic designs etc.;

(2) Structural design: When the bridge type is decided, participants shall design the primary load-bearing components and major ancillary facilities. Additionally, the strength, stiffness and stability of the bridge structures shall be ensured through reasonable load combination and internal force calculations;

(3) Materials: steel, concrete, combination and mixed, FRP composites; new materials, etc.;

(4) Construction schemes: advanced, innovative and applicable construction schemes;

(5) Design concepts: safety, applicability, durability, innovation, aesthetic features, environmental sustainability, low carbon consideration, energy conservation, economy, constructability, easy maintenance, etc. Each work shall follow at least three of the above design concepts.

II. Entry requirements

1. It is recommended that the participants prepare a design appraisal with (preferably hand) sketches in preparation for the selection of the type of bridge. The



appraisal should include two distinct and viable options for the proposed bridge structure, and how loading transfers from the main functioning frame to the substructure. Due consideration should be given to the bridge's serviceability and stability aspects. Review and critically appraise the two schemes (such as sustainability, functionality, buildability, carbon reduction and whole life costing) and identify the final chosen solution. Please specify the reasons for the choice before carrying out the final design.

2. The electronic version of the work description shall be submitted in Word format. If it's in Chinese, use Song font with 4-size characters, 28-point line spacing, no more than 20 pages and 15,000 words; For English submissions, use Times New Roman font with size 11, single line spacing, no more than 35 pages and 10,000 words;

3. The number of design drawings (design schemes, main structural drawings, construction schemes, etc.) shall not be more than 10 pages of A3;

4. Renderings: color images with no more than 5 pages of A3. The electronic version should be submitted in JPG format.

Category C: Scene Modelling and Visualization

I. Modelling and Visualization Requirements

1. You shall choose a landscape based on the history, culture, customs, and



geography of your chosen region. The landscape shall be typical of railways and stations along the Belt and Road, and reflect the characteristics and economic and cultural development of your chosen region.

2. You shall choose your data source, modelling tools, and visualization platforms according to the features of your chosen landscape and the application scenarios of the 3D model. We encourage participants to set their creativity and innovation capacity free and complete the modelling and visualization with your self-developed plug-ins. One principle is to be followed during the process of data collection, 3D modelling, and visualization: You shall pay attention to the unity between fidelity and artistry, and between the model's functionality and application scenarios.

3. Coverage and accuracy of the model: The parameters vary according to each participant's application scenarios. However, the following requirements must be met: The coverage area should be no less than 100m², with the length of one side no less than 5m. There should be no obvious omissions in the main artificial surface features of the model. The geometric accuracy should be no less than 5cm. The texture of the model should be able to represent the real-world landscape without obvious omissions.

4. Requirements for the submitted landscape models of railway stations are as follows:



(1) Landscape features: mainly cultural landscapes such as railway stations, platforms, and typical scenarios characterized by railway features along the Belt and Road, supported by natural landscapes such as vegetation and waters;

(2) Modelling data: including but not limited to point cloud and image data collected by drones and ground platforms;

(3) Model formats: osgb, obj, ifc, dae, dxf, kml, 3ds, etc.;

(4) Implementation plan: It should be scientific, innovative and applicable;

(5) Modelling concepts: The 3D modelling, display, and visualization should embody design concepts such as creativity, artistry, practicability, science, etc.

II. Entry Requirements

1. Your submission shall include a modelling and visualization proposal, a 3D model, and renderings.

2. Your modelling and visualization proposal shall be illustrated by text and graphics, and submitted in .docx format. If it's in Chinese, use Song font with 14-point characters and 28-point line spacing, no more than 20 pages and 15,000 words; For English submissions, use 14-point Times New Roman font with 28-point line spacing, no more than 35 pages and 10,000 words.

3. Your 3D model shall be submitted in the electronic format, where you shall also attach a version to be visualized on given platforms, and indicate the theme of the digital town landscape you have constructed. If you have developed your own



visualization platform, a configuration file should also be submitted.

4. Your renderings should be color images with no more than 5 pages of A3.

Electronic versions should be submitted in common formats such as jpg, png, and pdf.

***Notes:** The software used in the entries is not limited. The Organizing Committee recommends software of Daspatial Technology Co., Ltd., including DasEarth (<https://earth.daspatial.com/>), GET3D Cluster, ModelFun, ModelPainter, DasViewer, etc. Download link: <https://www.daspatial.com/cn/download>. For limited-time free use and training, please contact LIU Lei (Cell: 0086-17692202215). Daspatial Technology Co., Ltd. reserves all rights for final interpretation.



Annex 2-1:

Work Recommendation Form: 2022 Belt and Road International Student Competition on Digital Architectural Design

University/ College Name			Contact Person	
E-mail			Tel.	
Work Recommendation Information (Each participating university recommends no more than 2 teams under each category.)				
Category	Work Name	Supervisor(s)	Participant(s)	
Architectural Design				
Structural Design				
Scene Modelling and Visualization				



Annex 2-2:

Entry Information Form: 2022 Belt and Road International Student Competition on Digital Architectural Design

University/College Name:			
Participant information (A participating team contains no more than 5 members)			
1			
Full name		School/Department	
Gender		Major/Research Field	
Passport No		Undergraduate/Postgraduate	
Tel.		E-mail	
2			
Full name		School/Department	
Gender		Major/Research Field	
Passport No		Undergraduate/Postgraduate	
Tel.		E-mail	
3			
Full name		School/Department	
Gender		Major/Research Field	
Passport No		Undergraduate/Postgraduate	
Tel.		E-mail	
4			
Full name		School/Department	
Gender		Major/Research Field	
Passport No		Undergraduate/Postgraduate	
Tel.		E-mail	
5			
Full name		School/Department	
Gender		Major/Research Field	
Passport No		Undergraduate/Postgraduate	
Tel.		E-mail	
Supervisor information (A participating team contains no more than 2 supervisors)			



1			
Full name		Position	
Title		E-mail	
2			
Full name		Position	
Title		E-mail	
Entry information			
Title of entry	(name of entry + abbreviation of university + participant name)		
Category (Please tick \checkmark in \square)	<input type="checkbox"/> Architectural Design <input type="checkbox"/> Structural Design <input type="checkbox"/> Scene Modelling and Visualization		
Submission date			
WeTransfer Link			
Design Description (Within 200 words)			

Notes:

1. Fill in the form separately for each work.
2. If the work is awarded, the names of participants and supervisors on the trophies and certificates will be listed in the above-filled order.
3. In addition to this form, the submitted works shall be submitted with electronic design contributions. See *Call for Participation* for specific requirements. The electronic contribution file name of the submitted work must be filled in according to the format requirements (example format in brackets) in the entry information form.
4. Please send the electronic design contributions by WeTransfer and fill in the WeTransfer link. See *Submission Guidelines* for the details. Please send this form to brauic@163.com.