Bentley Institute

2020 Student BIM Challenge – Hong Kong

Around the world, engineers, architects, surveyors, constructors and owner-operators are using Bentley’s software solutions to accelerate project delivery and improve asset performance for the infrastructure that sustains our economy and our environment. Together, we are advancing infrastructure.

Bentley Institute supports student leadership in the exploration and application of software, in pursuit of the skills needed as future infrastructure professionals.

We invite all students in Hong Kong to participate in the Bentley Institute 2020 Student BIM Challenge, which recognizes innovative and technically advanced projects created by university and technical college students from Hong Kong.

Explore the rewards of testing your design skills, while leveraging powerful technology from Bentley, to produce amazing infrastructure projects and showcase them for the world to see!

Submission Deadline: 1 March 2020

Project submissions—including all required supporting materials—must be received no later than this date.

Participation:

Interested candidates may submit projects either

• created by an individual student
• or created by a team comprised of a maximum of 4 students (names of all contributing students must be submitted).

Submission requirements:

• Submission Date: 1st February 2020 – 1st March 2020
• Please submit a small video or presentation explaining the project.
• All the files should be submitted in the zip format.
• Projects need to send to us along with all required materials by 1 March 2020
• Each project submission must include a completed 2020 Participation Agreement and Submission Information form, signed by all team members.
• Each project submission must include acceptance of a Participation Terms and Conditions and completion of all Submission Information, as mentioned in the Participation Terms and Conditions.

http://www.bentley.com/academic
Judging Criteria:
Each project will be evaluated by jurors based upon creativity, aesthetics, technical merit, and the included brief project presentation.

Prizes:
Winning students will receive:
- A HKD$8,000 equivalent Scholarship for the winner (team based).
- A HKD$5,000 equivalent Scholarship for 1st running-up (team-based)
- A HKD$2,000 equivalent scholarship for 2nd running-up (team-based)
- Recognition and prize presentation at their school or at a Bentley event
- Recognition of your project on Bentley’s websites and social media channels, to showcase your talent for potential employers.

Participation Terms and Conditions: Please read.

If you wish to participate in the competition, but you don’t have access to Bentley software or any enquiries, then write to us at jimmy.lau@bentley.com, with “2020 Student BIM Challenge” mentioned in the subject line.

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Sample Projects (1):

Innovation in Data Capturing for BIM
(Using ContextCapture and OpenBuildings Designer)

**Project Statement:** Your school (or community) is preparing for future development projects. Help capture part of the existing conditions, and produce a detailed and precise 3D model, to provide real-world context for expansion projects.

Select an object or structure of interest that is outdoors (for example, on your school’s campus). A typical example would be a statue, sculpture, or other structure that you can capture without any obstructions. We highly recommend selecting something no more than 20 feet tall, so you can capture the entire top surface without difficulty. Note: if you select a building, ensure that you will be able to photograph it from a sufficient distance (unobstructed) to capture the entirety of the roof; flat-roofed buildings cannot be selected for this reason.

Take a series of photographs of the selected object, use ContextCapture to convert those photos into a highly detailed 3D reality model, and compare measurements to ensure accuracy.

Full details, requirements, and instructions are provided below.

**Submission Requirements:**

1. 2020 Participation Agreement and Submission Information form, signed by all team members
2. ContextCapture model file (.3MX format)
3. MicroStation file (.dgn) with imported ContextCapture model
4. Project presentation (total of 3 PowerPoint slides), briefly describing your project’s workflow and highlighting any features you believe distinguish your project and creation. You must include details of the three measurements taken from the real-world object (see Project Tasks).

[http://www.bentley.com/academic](http://www.bentley.com/academic)
Judging Criteria:
- Clarity and accuracy of ContextCapture model
- Quality of MicroStation file

Project Tasks:

1. Using a smartphone or a DSLR camera, take a series of photographs of the entire area of interest, with minimum of 60% overlap between pictures. Use of a GPS-enabled camera is highly recommended; most smart phones have this feature built in. For tutorials:
   a. Refer to the ContextCapture Quick Guide
   b. Access On-Demand training via STUDENTserver, and also via our video library:
      i. Reality Modeling - Integrating Acute 3D Models into your Workflow
      ii. Academic Webinar -ContextCapture: Introduction to Reality Modeling Part 1
2. Carefully measure and record the length of at least 3 segments of the object.
3. Using ContextCapture software, create a 3D Model of your area of interest:
   a. Perform Aero-Triangulation
   b. Generate a fully rendered 3D Model in standard format of the software (.3MX)

4. Use ContextCapture Viewer software to view the ContextCapture model. Use the Measure Distance/Area /Volume tools, within the viewer, to estimate lengths, areas or volumes of some features in your object of Interest. Check if the three distances measured earlier, of the real object, are the same as those same distances in your 3D model. If not, use corrective measures to regenerate the model so the model lengths match the distances in reality.

5. Import the .3MX model into OpenBuildings Designer. Measure the three distances again, in the model, to compare against the lengths you recorded of those features in reality.
Sample Projects (2):

Innovation for Reality Modeling and Visualization for BIM

**Project Statement:** Your community wishes to develop an area with existing structures into a park, to create more green space and lower CO2 levels. Capture the existing conditions to produce a 3D model, and then create a compelling presentation of your park design—to help all stakeholders easily see and approve of your vision for improving the area as a park (with additional trees and plants, etc.).

Select an object or structure of interest that is outdoors (for example, on your school’s campus). A typical example would be a statue, sculpture, or other structure that you can capture without any obstructions. We highly recommend selecting something no more than 6m tall, so you can capture the entire top surface without difficulty. Note: if you select a building, ensure that you will be able to photograph it from a sufficient distance (unobstructed) to capture the entirety of the roof; flat-roofed buildings cannot be selected for this reason.

Take a series of photographs of the selected object, and use ContextCapture to convert those simple photos into a highly detailed 3D reality model. This model will provide real-world context for your project.

Next, open the model in OpenBuildings Designer to make any necessary modifications, and take measurements in MicroStation to compare against reality (thereby determining the accuracy of the model).

Finally, export the file from OpenBuildings Designer to Bentley LumenRT to create a LiveCube. Add digital nature and animate your project with vehicles, people, wind-swept plants, seasonal trees, water, and more—to create stunning visuals! Create a video clip, and share the LiveCube and video to showcase your completed project.

[http://www.bentley.com/academic](http://www.bentley.com/academic)
Submission Requirements:

1. 2020 Participation Agreement and Submission Information form, signed by all team members
2. ContextCapture model file (.3MX format)
4. MicroStation file (.dgn) with imported ContextCapture model
5. LumenRT LiveCube
6. 2 image files of your choice from LumenRT
7. Video file created in LumenRT

Judging Criteria:

- Clarity and accuracy of ContextCapture model
- Quality of MicroStation file
- Creativity, complexity, and aesthetics of LumenRT environment created and of accompanying video clip

Project Tasks:

1. Using a smartphone or a DSLR camera, take a series of photographs of the entire area of interest, with minimum of 60% overlap between pictures. Use of a GPS-enabled camera is highly recommended; most smart phones have this feature built in. For tutorials:
   a. Refer to the ContextCapture Quick Guide
   b. Access onDemand training via STUDENTserver:
      i. Reality Modeling - Integrating Acute 3D Models into your Workflow
      ii. Academic Webinar -ContextCapture: Introduction to Reality Modeling Part 1

2. Using a measuring tape, record the length of at least 3 segments of the object.

3. Using ContextCapture software, create a 3D Model of your area of interest:
   a. Perform Aero-Triangulation
   b. Generate a fully rendered 3D Model in standard format of the software (.3MX)

4. Use ContextCapture Viewer software to view the ContextCapture model. Use the Measure Distance/Area /Volume tools, within the viewer, to estimate lengths, areas or volumes of some features in your object of Interest. Check if the three distances measured earlier, of the real object, are the same as those same distances in your 3D model. If not, use corrective measures to regenerate the model so the model lengths match the distances in reality.

5. Import the .3MX model into OpenBuildings Designer. Measure the three distances again, in the model, to compare against the lengths you recorded of those features in reality.

6. Export the file from OpenBuildings Designer into Bentley LumenRT to add a virtual environment surrounding your 3D model. Use the included library of 3D content to add people, plants, vehicles, etc.; sculpt the terrain, set the weather and season, and add animation paths to enliven your design.

http://www.bentley.com/academic
7. Create a video clip and publish your LiveCube to share your creation. For tutorials:
   a. Access onDemand training via STUDENTserver:
      i. Bentley LumenRT Basics
      ii. LumenRT: Introduction to Reality Modeling Part 2
      iii. Creating Visualizations with Bentley LumenRT in a Building Project (with MicroStation CONNECT Edition - Lecture)
   b. Find additional Getting Started tutorials here: http://www.lumenrt.com/support/

More examples: https://www.youtube.com/playlist?list=PLZVgnvview0cwxtYPsr2aMX7pbvJNZNHP

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Participation Terms and Conditions

1. I agree to submit the Bentley Institute Student Design Competition project listed below to be included in the Bentley Institute Student BIM Challenge (the "Project").

2. The “Materials” covered under this agreement shall include the Project and all project information, files, images, and any reference materials used in support of the Project.

3. I grant Bentley, its channel partners and all its subsidiaries and affiliates a perpetual, worldwide, nonexclusive, royalty-free right to use, reproduce, display, distribute, or incorporate in any way the Materials (or any portion of the Materials) in any works or media, for marketing, pre-sales support, advertising, social media, and training, as well as for non-commercial purposes, including, but not limited to reproduction in established industry journals and other third-party publications, case studies, and media web sites. I also grant Bentley the right to make derivative works based upon the Materials for marketing, pre-sales support, advertising, and training purposes.

4. I understand that this agreement does not prohibit me from using the Project in the future in my own professional or personal work.

5. I hereby represent and warrant that I am the exclusive owner of all rights in the Materials and that the Materials are not the subject of third-party liens or claims of ownership.

6. I represent and warrant that the Materials do not infringe any copyright, trademark or other third-party proprietary rights and comply with all applicable laws.

7. In addition, I represent and warrant that no further permissions or payments are required for use of the Materials.

8. I waive any right to review or approve any works in which the Materials may appear, and waive any and all claims against Bentley related to Bentley's use of the Materials.

9. I represent that I am of legal age and am authorized to execute this agreement. I am studying in one of the Universities which come under Hong Kong SAR Regions.

10. I agree that in the event the Project is not submitted under a suitable and compatible competition category, Bentley may place the Project in a category that best fits the Project's goals and/or achievements.

11. I agree that Bentley may provide the Project and Materials to third parties (jurists) for review in conjunction with the Bentley Institute Student Design Challenge. Jurors will treat the materials as the proprietary intellectual property of the nominee.

12. I confirm that the Project was completed by students in its entirety and did not receive contributions from others, including instructors, parents, professionals, or any individuals who are not listed on the submission form.

13. I will be able to register for the challenges on the websites as the dates approach. I can register to compete only once. Participation of the same student at more than one school/institute is not acceptable.

14. I declare that my submitted entry does not contain anything that is or may be (as determined in Bentley Institute or jury’s sole discretion): (i) threatening, harassing, degrading, stalking or hateful; (ii) defamatory; (iii) fraudulent or tortious; (iv) obscene, indecent or otherwise objectionable; (v) protected by copyright, trademark, patents, utility models, design patents or other proprietary right without the express prior written consent of the owner of such right; (vi) dangerous or

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potentially dangerous; or (vii) contrary to policies and guidelines of Government of Hong Kong SAR Regions.

15. I declare that my submitted entry does not violate any third party’s publicity or privacy rights. If any entry contains the name, voice, likeness, image or written or spoken words of any third party, I have obtained the third party’s written consent to include such materials in the entry prior to submitting the entry.

16. By registering for the competition, I am allowing Bentley to contact me regarding their academic activities related to the competition.

17. If a student is working on a project where there is use of multiple software from other companies (including Bentley software), the student can highlight the use of Bentley software as a part of their solution in the project. The part where Bentley software is used will only be considered during the evaluation.

18. All terms and conditions mentioned herein are at the sole discretion of Bentley Institute and subject to change as deemed suitable by Bentley Institute.