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## OptiQ Bell Game

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a competition for all European students description

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Title:	<b>OptiQ Bell Game Design Competition</b>
On-line registration:	<b>09.09.2024 – 21.09.2024</b>
First-stage submission:	<b>09.09.2024 – 06.10.2024</b> <sup>1</sup>
First-stage evaluation end:	<b>11.10.2024</b>
Secon-stage presentations:	<b>14.10.2024 - 18.10.2024</b>
Final results:	<b>18.10.2024</b>

## Description

Competition concerns the development of a premise for a serious game. Its main goal is to generate the sequence of pseudo-random symbols basing on the Human Player behavior inside the game and transparently for this Player. The proposal should be in a form of Game Design Document (so called GDD), the proof-of-concept, and a pitch-deck presentation which will be shown during the settlement process. Template for GDD document is the appendix to this description. The experiment of Bell's inequality planned to be performed in the project assumes human participation. Hence, the developed serious game's purpose is to generate the pseudo random data, that will be delivered to the quantum system implementing it. This process should be, on one hand transparent for the Human Player. The user cannot find out, both when such data are generated and that they are generated at all. However, on the other hand its generation should be caused by Player actions in a game. Generated data are very simple – there is only required sequence of zeroes and ones meaning True and False, or Eagle and Heads which should be which should be drawn with a uniform distribution depending on the Player actions in the game. In case the game will meet the project requirements it will be implemented in the OptiQ project (WP5). Participants can take part in this deployment remotely or as a secondees in the project.

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<sup>1</sup> registration required

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## Who can be competitor

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**Participants** in the competition can be students studying in the European Union countries and countries associated with the Horizon Europe project (such as Ukraine or the United Kingdom).

It is permissible for a participant to be supported by a formal or non-formal group of **sympathizers** (Study Circle, group of colleagues, etc.), but in the event of a win, participation in the Topical School will be free of charge only for the participant. The entire group can participate in the rest of the benefit.

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## What is expected of participants?

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At least the following are required for a valid submission of a work to the competition:

1. Development of the **Game Design Document (GDD)** according to the given template.
2. **Proof – of – concept** made in Unity 3D or Unreal 3D engine, published on the public repository shared by Organizer. It should be short but playable demonstration of the idea of the game e.g., one level or even its fragment, the fragment of the location, etc.
3. The **movie** of the proof-of-concept application.
4. Description of the method of **0-1 sequence generation**. It should be just description in separate document, not implementation.

A proposal for the implementation of an experiment on Bell's inequality, powered by the said sequence of zeros and ones, is *not required* for submission, but is very welcome. Additional points will be awarded for proposing it.

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## Benefits

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For all participants (including sympathizers):

1. Active participation in an interesting & international research project – OptiQ
2. Free remote participation in at least three webinars which will be organized in the first-stage submission period. Webinars will be in

the form of streamed, remote lectures or workshops. Participation in the streaming will allow questions to be asked of the presenter, including those about the requirements for the designed serious game.

**For the winner, second and third place:**

1. There will be free and **personal participation in a Thematic School** on the generation of entangled photons and experiments related to Bell's inequality. Furthermore, the winner may designate a companion from among the sympathizers. If he or she does not indicate it, we will invite the participant who won fourth place.
2. If the winning game design meets the project requirements, it will be **implemented as part of the project** and the participant and all sympathizers will be listed in the relevant scientific publication as **co-authors**.
3. All such Participants (the winner, second and third place) will be invited to remotely participate in the **implementation** of a serious game in the OptiQ project.
4. All such Participants, in case of fulfilling the eligibility criteria of the MSCEA SE rules, will be invited to be **secondees** of the project, in the limit of vacancies in the OptiQ project.