



IEEE EMBS ISC 2016

Expanding the Boundaries of Biomedical Engineering and Healthcare

May 29th - May 31st 2016

Ottawa, Canada

Call for Design Competition Entries

IEEE EMBS ISC 2016 is proud to present an undergraduate design competition! This is an opportunity for students to showcase their engineering innovation and creativity by addressing an issue in biomedical engineering. The competition is open to individuals and groups of up to 5 students. Top submissions will be posted on the [website](#), and will be asked to present at the competition for judging. Prizes will be given to the top 3 projects. Refer to the sections below for details on the scope, submission guidelines, and timeline.

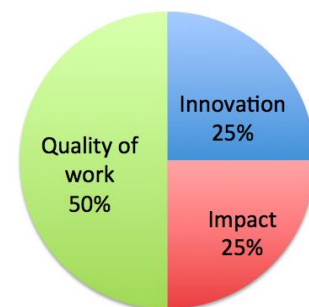
Scope

The theme of the design competition is *Extending the Applications of Biomedical Engineering*. Entrants are challenged to:

- Identify an issue within the field of healthcare, biomedical engineering, and/or medicine;
- Realistically assess the significance of this issue within the broader scope of this field;
- Rigorously apply engineering and scientific principles to design a solution to this issue;
- Communicate the impact and innovation of this design in a professional manner.

The competition will be judged based on three criteria:

- **Impact (25 %):** Justification of the requirement of a solution. Does your design address a legitimate problem? Will your solution drastically improve the quality of life of its intended users? How many people seek to benefit from your design?
- **Innovation (25 %):** Is your design feasible? That is, is your solution practical? Is this solution novel?
- **Quality of Work (50 %):** How complete is the presented design? Is the objective, methodology, design, and analysis presented in a coherent manner? Do the applied methods abide by industry standards?



This design competition is concerned with practical solutions to real-life problems. Novel methods are not necessarily expected, but any applied methods must be rigorous and applied effectively for medical applications.



Submission Requirements

The submitted design competition report must follow the [supplied template](#). Submission should be a maximum of 3 pages, excluding the appendix. The submission should include the following sections:

- **Abstract:** In one hundred words or less, present a brief summary of the work. Ensure the considered problem, solution and impact are presented clearly. Very briefly present the key achievements in the development of the current work.
- **Problem Statement:** State the problem the design is seeking to address. Include enough background information to understand the problem. List any current solutions and their deficits. Specify any design requirements and justify their use.
- **Proposed Solution:** Describe the current approach to solving the problem. State the overall concept of the solution and how the solution satisfies the design requirements. If applying existing methods to a new problem, provide background on the methods employed. Clearly indicate the benefits of the current approach compared to other possible solutions.
- **Impact:** Elaborate on the impact of the design to society and on the scope of the addressed problem. Specify who will benefit from the work and how will the design benefit them. Can the development of the device further other areas of research? Are there economic consequences to the design? Do not limit the impact to only the current achievements; discuss the impact of the final design if it were to be completed.
- **Project Development:** Outline the current development of the project. Specify what milestones have been met and how. Detail and explain any results obtained. Feel free to divide project development into multiple subsections to more clearly organize the work. Emphasis should be placed on tangible progress: the results of testing, the development and performance of prototypes, preliminary testing to validate design requirements, etc.
- **Conclusions:** Briefly outline the main results of the current project development. The conclusion should clearly state the key results that prove the work is deserving of winning the competition.
- **Appendix:** An appendix is allowed and does not count toward the 3 page limit. The appendix is meant to contain all figures and tables required for the submission. Any table or figure in the appendix must be referred to in the body of the report. Captions for the figures and tables are required; however, no other accompanying text can be added in the appendix.



Timeline

The following details the schedule of events for the design competition:

Activity	Start	End
Initial submission	October 14, 2015	April 08, 2016
Notification of acceptance		April 14, 2016
Peer review	April 15, 2016	April 30, 2016
Optional re-submission	April 15, 2016	April 30, 2016
Conference evaluation	May 29, 2016	May 31, 2016

Submissions of entries are invited through the [Entry submission system](#). Note that the submission system for the design competition is distinct from the conference paper submission system.

Peer review: Following the notification of acceptance, the top 15 submissions will be posted to the [website](#) with identifying information removed. In this second portion of the competition, entrants are invited to examine other reports, and are given the chance to re-submit. **Re-submission is entirely optional.**

Contact

Member	Role	Contact
Raymond Greiss	Competition chair	raygreiss@gmail.com
Burhan Terai	Competition co-chair	bterai@gmail.com

Submission Notes

Submissions will be reviewed and assessed based on quality, scientific merit, and best means of presentation. All submissions will be screened for [plagiarism](#). Please review the [IEEE Author Rights and Responsibilities](#) prior to submission.



ISC Design Competition Rubric

	Incomplete	Developing	Accomplished	Exemplary
Impact (25 Points)	<ul style="list-style-type: none"> No justification of need; unclear Insufficient or irrelevant background information Missing context of work <p>(0-5 Points)</p>	<ul style="list-style-type: none"> Need is mainly clear Provides most of the background information needed to understand problem Provides some context of work <p>(15 Points)</p>	<ul style="list-style-type: none"> Clear justification of need Provides background information needed to understand problem Provides context of work <p>(20 Points)</p>	<ul style="list-style-type: none"> Clear justification of need; demonstrates scale of impact and importance to stakeholders Well researched; provides background information needed to understand problem Provides good context of work (how this work is situated in relationship to other relevant works) <p>(25 Points)</p>
Innovation (25 Points)	<ul style="list-style-type: none"> Objective is unclear, lacking, or inaccurate Solution is not aligned with issue or is impractical <p>(0-5 Points)</p>	<ul style="list-style-type: none"> Objective is mainly clear, but could have been better aligned with what was actually done Proposed solution somewhat addresses the issue <p>(15 Points)</p>	<ul style="list-style-type: none"> Objective is clear, but not is aligned with what was done Proposed solution is not novel, but addresses the issue Solution is practical <p>(20 Points)</p>	<ul style="list-style-type: none"> Clear, concise, precise objective Proposed solution is novel and addresses the issue Solution is practical <p>(25 Points)</p>
Quality of Work (50 Points)	<ul style="list-style-type: none"> Methods are unclear, details are irrelevant and methods not aligned to objective Data is difficult to understand; data is irrelevant Analysis and discussion is unclear or irrelevant Conclusions unclear or irrelevant Information is disorganized; ideas do not seem connected <p>(0-15 Points)</p>	<ul style="list-style-type: none"> Methods are mainly clear; some details are not well- communicated (not fully clear how research was performed); details are sometimes irrelevant; methodology not fully aligned with objectives Data is difficult to understand at times; not entirely relevant Analysis and discussion is at times unclear or irrelevant Conclusions are mostly clear, mostly relevant; somewhat aligned with objective Information is organized, ideas somewhat connected together <p>(30 Points)</p>	<ul style="list-style-type: none"> Clear description of methods; sufficient details provided to understand how research was performed; details provided are mainly relevant; methodology addresses objective Data summarized is relevant and communicated in an understandable manner Analysis and discussion is mainly clear, relevant, and has some insightful points Conclusions are clear; aligned with objective Information is mainly organized logically; ideas are well-connected <p>(40 Points)</p>	<ul style="list-style-type: none"> Clear description of methods; sufficient details provided to understand how research was performed; methodology addresses objective, limitations, and constraints Methods are rigorous, abide by industry standards Data summarized is relevant and effectively communicated through appropriate use of figures and tables Analysis and discussion is clear, comprehensive, insightful Clear, concise conclusion; aligned with objective Information is organized logically; ideas are well-connected and flow High overall coherence in writing <p>(50 Points)</p>