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III Conrado Silva Student Acoustic Contest (CACS)

Held during the XXX Meeting of Sobrac

Abstract: Conducted during the XXX Sobrac Meeting in Natal-RN (2023), the III Conrado Silva Student Acoustic Contest (CACS) sought to raise awareness regarding the significance of acoustics in school architecture by exploring innovative solutions for learning environments. Seven multidisciplinary teams participated in the competition, developing proposals at the massing/volumetric level for a school intended for the upper years of elementary education, with a focus on incorporating acoustic considerations from the earliest stages of the design process. Additionally, the teams presented a preliminary design solely for the learning sector, in which three specific environments were chosen for sound conditioning projects: a classroom, an auditorium, and one additional space of their choice. Supported by three sponsoring companies, the event recognized the three most outstanding proposals, whose merit was further highlighted by their publication in the Acoustics and Vibrations Journal, underscoring the crucial role of acoustics in the design process.

III Concurso Estudantil de Acústica Conrado Silva – CACS

Resumo: Realizado durante o XXX Encontro da Sobrac em Natal-RN (2023), o III Concurso Estudantil de Acústica Conrado Silva (CACS) promoveu a conscientização sobre a importância da acústica na arquitetura escolar, abordando soluções para espaços de aprendizagem. Sete equipes multidisciplinares se inscreveram no concurso e desenvolveram propostas em nível de planos de massas/volumetria de uma escola para os anos finais do ensino fundamental, pensando na acústica desde as primeiras decisões projetuais. Além disso, as equipes propuseram um anteprojeto apenas do setor de aprendizagem, no qual foram escolhidos três ambientes para projetos de condicionamento sonoro (sala de aula, auditório e outro ambiente de livre escolha). O evento, apoiado por três empresas patrocinadoras, premiou as três melhores propostas, cuja relevância garantiu a publicação na Revista Acústica e Vibrações, destacando a importância da inclusão da acústica no processo de projeto.

1. Introduction

Inspired by the legacy of Conrado Silva, the III Conrado Silva Student Acoustic Contest — see the CACS logo in Figure 1 —, took place during

Figure 1: Official logo of the III CACS.

 DOI:

the XXX Meeting of the Brazilian Society of Acoustics (Sobrac), in Natal-RN, in 2023. Through this contest, Sobrac aims to enhance students' awareness of acoustics within undergraduate programs, as well as to encourage technical quality, creativity, and innovation in acoustical-architectural solutions for the proposed problem. Additionally, the contest seeks to strengthen the importance of the many interfaces of acoustics within the academic community.

For the third edition of CACS, the chosen theme was "**Acoustic quality in the school environment: emphasis on learning spaces**." Acoustics in schools urgently requires attention, as excessive noise in educational settings seriously compromises both the physical and mental health of teachers and students. The consequences include reduced speech intelligibility, loss of attention, concentration, and voice, fatigue, psychological instability, and aggressive behavior, among other effects. Thus, the III CACS fostered an in-depth reflection on the acoustic quality of these spaces.

The committee's concept for the III CACS was to develop, at the level of **massing/volumetry**, a proposal for a school catering to the final years of elementary education (6th to 9th grade, Fundamental II), designed for students aged between 11 and 14. Following the massing plan, a **preliminary design of the learning sector** was to be produced, in which **three (3) environments** were to be selected for the basic projects of **sound conditioning** (mandatorily including a classroom, an auditorium, and one additional space of the participants' choice). This approach ensured that acoustics were appropriately addressed across the three design scales, thereby fostering a development from the macro to the micro—an essential process for achieving acoustic excellence in design.

It is worth noting that this edition of CACS received support from three sponsoring companies: Ecophon Saint-Gobain, Técnica Soluções Acústicas, and Trisoft. Their acoustic products were utilized by students in designing the acoustic conditioning of the three learning environments, with each company's material designated for one of the spaces.

The contest was intended for undergraduate students regularly enrolled in higher education institutions offering at least one course component covering acoustics. In this edition, multidisciplinary teams composed of students from different programs and from at most two (2) different universities/institutions were encouraged to participate.

2. Brief Report

In February 2023, the regulations for the III CACS were published on the website of the XXX Meeting of the Brazilian Society of Acoustics, containing the deadlines for registering teams, submitting material, judging and announcing the results, which took place on November 22, 2023.

The contest's organizing committee consisted of three Acoustics professors from different higher education institutions: Prof.ª Dr. Juliana Costa Morais (UFPB), Prof.ª Dr. Maria Fernanda Oliveira (UNICAMP), and Prof.ª Dr. Marina Cortês (UFRN) — coordinator. In addition, the members of the III CACS evaluation committee, who were only revealed at the end of the process, were consultant and Prof.ª Dr. Maria Lygia Niemeyer (UFRJ), consultant MSc. Marcos Cesar de Barros Holtz (Harmonia), and Prof.ª Dr. Stelamaris Rolla Bertoli (Unicamp). During the Sobrac event, there was an area set aside for the exhibition of the III CACS printed works, where the evaluators could get to know the proposals better. The papers were displayed without identifying the participants, ensuring a blind evaluation. After a meeting and consensus among the evaluators, the three best proposals were chosen.

In this edition, seven teams signed up. At the end of the event, the trophies were handed out (see Figure 2), followed by the cash prizes. The winning teams were (see Figure 3 for a photo of the winning teams at the awards ceremony):

1st place: the team comprising Débora Nogueira Pinto Florêncio (advisor) and Nailma Cavalcanti da Cunha, from Centro Universitário do Rio Grande do Norte – UNI-RN;

2nd place: the team comprising Ranny Loureiro Xavier Nascimento Michalski (advisor), Edna Sofia de Oliveira Santos (co-advisor), Marco Aurélio Stoppe Nogueira, and Ruan Matos da Silva, from Universidade de São Paulo – FAU-USP; and

3rd place: the team comprising Bianca Carla Dantas de Araújo (advisor), Vitoria Jade Alves de Carvalho, and Gabriela Tabita da Silva, from Universidade Federal do Rio Grande do Norte – UFRN.

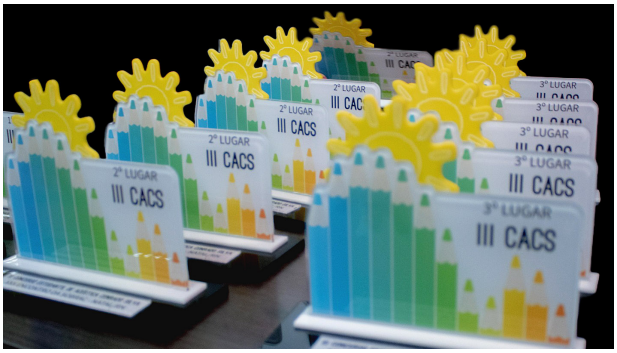

Figure 2: III CACS trophies.

Figure 3: Photo of the winning teams with the III CACS committee.

For this contest, a logo was designed, making reference to the theme of the competition (colored pencils) and the logo of the XXX Sobrac Meeting (dune and sun), as shown in Figure 1 and present on the trophies in Figure 2.

It is worth noting that, during the process of building the proposals, the III CACS Organizing Committee promoted an online workshop, held on October 6, 2023, entitled "CACS Workshop: sound conditioning materials". The aim of this workshop was to provide a space to highlight the innovative solutions of the companies sponsoring the competition, enabling the community attending the XXX Sobrac Meeting to better understand how their technologies and services contribute to improving the quality of classrooms and other learning environments, the central theme of the competition.

Given the seriousness and quality of all proposals presented at the III CACS, the journal *Acoustics and Vibration* extended an invitation to publish the works as articles, further underscoring the importance of this contest. Lastly, the organizing committee expresses its gratitude for this opportunity and looks forward to the next edition of the contest, thereby continuing to promote the inclusion of "acoustics" in the design process.