SBA Jovem – Student Chapter of the Brazilian Automation Society: A New Approach in the Education of Control Engineering in Brazil

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Abstract: This paper presents SBA Jovem, a student chapter of the Brazilian Automation Society as a new approach to promote Control Engineering in Brazil, reporting some experiences in the creation of a student representation, showing ideas that worked, challenges that have emerged and expectations for the future. SBA Jovem is a national committee, nongovernmental, nonprofit, which aims to promote the dissemination of science and technology of automatic control among high school students, both at undergraduate and postgraduate level. By promoting actions with the support of organizations, businesses and educational institutions, SBA Jovem intends to create a new channel for educational and professional development in the area of control and automation. Through SBA Jovem it is possible to invest in new approaches to meet society, students and engineering, in particular, control engineering, and thus boost the development of the automation area in Brazil.

Keywords: SBA Jovem, Brazilian Automation Society, control engineering, curricular development, control education.

1. INTRODUCTION

Engineering plays a key role in technical and scientific development of a country, contributing significantly to its growth. Nevertheless, it is necessary to work on several aspects that are part of a larger context from which engineering is a part, not only valuing the technical training of an engineer, but finding ways to develop characteristics that the labor market demands. However, this is not always taught in colleges or universities. Such characteristics as leadership and teamwork are pursued to improve the ways in which knowledge is transmitted, highlighting changes in the scenario of the education system engineering over the years.

In 2008, the Canadian Engineering Accreditation Board (CEAB) mandated that engineering program graduates must exhibit the attributes under the following headings:

- Professionalism;
- Impact of engineering on society and the environment;
- Ethics and equity;
- Economics and project management.

These features show that it is not enough for engineers to have only technical knowledge in their area, it is necessary to develop other competences and abilities. This approach for engineering education, highlighting the control engineering fundamentals and pointing out the fundamental changes occurring all around, casts doubt on whether the current education system responds to the needs of the twenty-first century (Djaferis, 2004) and Murray et al.(2003) shows that education in control is an integral part of community activities and automation of its most important mechanisms of transition and impact.

A report created by a commission in 2000, sponsored by the Air Force Office of Scientific Research (AFOSR), called the Panel on the Future of Control Dynamics and Systems, provided a renewed vision of the future challenges in such field. The intent of this report was to increase the overall visibility of research in control, highlighting its importance in applications of national interest and indicating some key trends that are
important to the vitality of the field (Murray, 2002). Knowing the need and importance of supplementary education in control engineering, this paper aims to present SBA Jovem, a student chapter of the Brazilian automation society as a complement for training control engineering students in Brazil, serving as a new channel for students to interact, exchange information and experiences, create extensive networks of contacts, participate in extracurricular activities and to develop features that the labor market requires, but are not taught in the classroom.

2. STUDENT REPRESENTATIONS AND STUDENT INITIATIVES

Student representation is an initiative that tends to grow based on the symbolic benefits it can provide not only to the students but also to companies or to the organization it represents. The student branch of IEEE (Institute of Electrical and Electronics Engineers) are examples of representations formed in the world by students from universities that are members of the institute, working with the mission to maximize the participation of undergraduate Brahmin is in a worrying situation, considering that currently it needs to have 50,000 graduate engineers a year for the country to meet its goal of growth. It is also important to highlight that among these engineers only a small fraction is composed of control and automation engineers.

Control engineers are important professionals because they can act in various application domains, such as in the industrial, residential, commercial and even in biomedical engineering and could play an important role in academic, both teaching in classrooms and as well as in the research field. There are various companies and institutions worldwide which seek to promote and develop the engineering of control and automation through projects and programs directed to the technical-scientific development of automation. It is highlighted here the International Federation of Automatic Control (IFAC) and IEEE - Control Systems Society (CSS). These organizations seek advances in theory and practice of control engineering as well as the development of engineering in general, with strong support from universities and large companies.

In Brazil, the main association representing the area of automatic control is the Brazilian Automation Society (SBA- an acronym for “Sociedade Brasileira de Automatica”), established as a nationwide association, having as main objective, to promote science and technology of automatic control in the wider context, in all systems (Pereira & Bottura, 2009).

It is important to note that many students do not know the associations related to their courses, in addition, another critical factor is the lack of interest from those who know the association in your area. Thus, it is necessary that such problems are evaluated before creating a student representation, then adopting a strategy to fix these deficiencies.

There are several ways through which a student representation can act, and one of the advantages of representing an association is to count on the support of companies and other academic institutions for the initiatives and projects of interest for all.

One way that a representation can achieve to integrate the students is via the use of ITC tools that are popularized among students, such as Twitter, Facebook, etc. The creation of a website is a good alternative to share information and to encourage students to interact with each other, and through it, creating of interactive communication using integrated tools of communication. But it is not only through this type of tool that representation should be supported because it is necessary that the student committee to be active through events with the aim of disseminating engineering and simultaneously complement the students education through projects of academic nature, focusing on additional training through short courses, seminars, lectures and technical events of this nature, because in addition, the group remains active and there is a stimulus for the participation of new students.

3. SBA JOVEM AND FORMS OF ACTING

SBA Jovem emerged as a proposal for a group of students in early 2009. Characterized as a national committee, nongovernmental, nonprofit, SBA Jovem has as objective to create a new channel to complement the training of engineering students in Brazil, especially students of control engineering and contribute to development of the area in the country.

Initially, the activities began in northern Brazil in early 2009 in the city of Belem, in the state of Para, through lectures at universities in the city, and then in Manaus, in the state of Amazonas, during the 61st Annual Meeting of the Brazilian Society for the Advancement of Science, held in July, 2009 in UFAM at a student forum hosted by the SBA.

To overcome the territorial obstacle with large distances between regions in Brazil, SBA Jovem makes intensive use of the internet, disseminating a virtual address (http://www.sbajovem.org). This has proved to be a tool for the growth of the committee. SBA also looks for partnerships with other student organizations, both national and international, in the area of control, creating then a new way to publicize and strengthen the activities of SBA Jovem.

Nationally, SBA Jovem is planning partnerships with other societies so that together they can develop and plan a way to step up and show the importance of these academic initiatives for the young audience. Currently, SBA Jovem has a partnership with SPEED - Student Platform for Engineering Education Development, and with that, there are great opportunities to make the committee even more known by students, therefore strengthen the relationship worldwide, contributing directly to their growth not only in Brazil but in world.
4. EVENTS AND ACTIVITIES ORGANIZED BY SBA JOVEM

In order to remain active throughout the year, SBA Jovem has duties to perform during the year. Providing lectures given by professionals, distributing printed educationa leaflets, organizing events and seeking partnerships with societies and universities are actions that attract new members to the committee, and such activities help to keep the group alive.

One of the successful stories, reminded here, is an activity that was quite satisfactory for the association, the realization of the STA (Semana de Tecnologia e Automatica), organized by SBA Jovem North, which took place from 1 to 4 December, 2009. A large number of new students joined the event, these students afterwards had become affiliated to the committee. During the event there were lectures, short courses, round table forums and exhibition of scientific papers. In Figure 1 it can be seen a picture taken during a lecture held in the STA, and in Figure 2, a picture captured during the presentation of an academic work in the event.

The control area is a subject traditionally taught, in many universities, in a conceptual manner. Many students lack practical skills in software and hardware laboratory (Bernstein, 2004). Therefore, SBA Jovem aims to develop activities that bring students and practitioners together, for example, through visits to the region's large companies and invited talks by renowned professionals. Figure 3 presents a picture taken during a technical visit to a hydroelectric plant.

Fig. 1. Lecture during event

Fig. 2. Poster presentation

Fig. 3. Technical visit of students

In 2010 occurred the annual meeting of automatic control organized by SBA Jovem in state of Pará. An event to impact students of control engineering. During this event occurred lectures, courses and workshops about robotic promoted by students and professors.

Fig. 4. Student Group of SBA Jovem North

Fig. 5. Students during lecture
5. RESULTS

Despite good results, there is still much to be done. However, through the experiences and challenges that have been found since its creation, it is possible to see the great potential for growth that SBA Jovem has, and one factor in the success of such initiative is that aspects such as leadership, teamwork, problem solving and analysis are examples of characteristics that are charged by the labor market, and besides it is not always taught in classrooms, it can be learned from a student when they participate in this type activity. Internet has proved to be an excellent tool to overcome the major concern, large distances, which normally prevents the growth of initiatives like that.

For the future, there are many plans to strengthen the activities of the committee to attract new members. Below are listed some projects that SBA Jovem has for the coming years:

- Create a grid formed by Control Engineering students in all the Brazil;
- National Conference of SBA Jovem;
- Expansion of committees of SBA Jovem in all the states of Brazil;
- Seek partnerships with universities, companies and other national and international student group;
- Development of social actions.

6. CONCLUSIONS

This article report experiences in creating SBA Jovem, as well as our experiences, thoughts and expectations for the future. We provide details of our experience around the activities carried out and solutions found to handle the challenges likely to come. We hope this work serves as a support and motivation for other students to join this type of activity or may perform the same platform as SBA Jovem adopted in its creation to establish other student representations of other courses. The next step to expand the committee is to create new branches in other Brazilian states.

SBA Jovem is looking for young students who want to improve themselves both technically and in the personal aspect. It is important to say that motivated students share similar interests that may end up in a powerful formula to strengthen and develop this type of activity.

It is known that the actuating model that adopts SBA Jovem is not new and is not unique, however, is a pioneering initiative in the field of control engineering in Brazil, and it is expected that over the years it can contribute significantly to the development of student members, bringing progress to automation in the country.

REFERENCES


