

MSP TALKS: SHARING EXPERIENCES AND INSPIRING PEOPLE

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Abstract— Conceived in December 2016, MSP Talks is an initiative of the Laboratory of Mechatronics and Signal Processing (MSP) of Instituto Federal Fluminense (IFF Campos) that aims to stimulate the academic and professional development of our community through talks with national and international guests who stand out in the areas of engineering, innovation and technology. We believe that sharing experiences not only broadens the horizons of our students and colleagues, but it is also a source of inspiration for building a better society.

Keywords— MSP Talks, Engineering Education, Higher Education, Sharing Experiences, Inspiring People

1 Background

Innovative practices in engineering education provide a solid path for the development of the academic community. Bringing together engineering students and professionals and researchers from leading institutions around the world enables an effective exchange of experiences, as well as being a source of inspiration for those who are about to begin their professional career. In this context, MSP Talks project – developed at Fluminense Federal Institute – connects different people in order to foster discussions about innovation, technology and engineering.

1.1 The Fluminense Federal Institute (IFF)

The Fluminense Federal Institute of Education Science and Technology (IFF) is a major public institution located in the state of Rio de Janeiro. In 2008, Brazilian federal government created the current administration, IFF, from the former CEFET Campos. There are 13 campuses and 10 centers located in 11 different cities. About 15000 students from high school to postgraduate degree attend to more than 100 courses in many areas. In addition, more than 1600 people work there, and this number tends to increase even more, since new courses will be offered soon (Portal do IF Fluminense, 2015a). Figure 1 shows the location of all the campuses and centers.

1.2 IFF Campus Centro

According to Portal do IF Fluminense (2015b), Campus Centro was established in 1910 by the former president Nilo Peçanha, who was born in Campos. It was originally meant to be an apprentice school named School of Apprentices and Crafters. However, after many upgrades and changes, Campos Centro became an important multilevel educational center. In fact, it is the largest campus of the Fluminense Federal Institute, with more than 5,000 students and about 500 employees. The institute offers primarily courses focused on science and technology, such as comput-

er, electrical, and automation and control engineering.

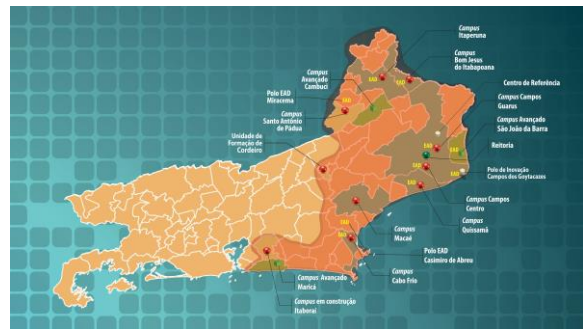


Figure 1. IFFluminense and its territory

1.3 Mechatronics and Signal Processing Lab

The Mechatronics and Signal Processing (MSP) research group was founded in 2011 within the Control and Automation Engineering Faculty at Instituto Federal Fluminense (Campus Centro). Our aim is to develop and apply mechatronic technologies to meet the needs of industry. Through the integration of distinct engineering areas and our member skills, we seek to achieve synergy among mechanics, electronics, signal processing, and control systems.

MSP Lab pursues excellence in the process of engineering development and its infusion in industry, providing applied research and technology to the society (MSP, 2015). Currently our research group is divided into the following areas:

- Embedded and Real-Time Systems;
- Engineering Education;
- Fault Detection and Diagnosis;
- Modeling, Design, and Simulation Tools;
- Signal Processing and Control Techniques.

Figure 2 shows the MSP Lab Facility.



Figure 2. MSP Lab Facilities

2 MSP Talks

Engineering education is a growing area of interest and connecting students with real-world experts is a source of inspiration for a better society. Inspired primarily by TEDx (TED, 2018), AsapSCIENCE (AsapSCIENCE, 2018), Talks at Google (Talks at Google, 2018), and PopTech (PopTech, 2018), MSP Talks is a project developed by the MSP Lab with the goal of connecting and inspiring students and faculty through sharing academic and professional experiences with people from all around the world. Each MSP Talk event consists of a monthly 40-minute videoconference with national and international guests who stand out in the areas of engineering, innovation and technology. Figure 3 shows one of the MSP Talks event.



Figure 3. Example of MSP Talks event

2.1 The MSP Talks Approach

MSP Talks primarily searches for potential speakers on social network (LinkedIn) and universities and research centers websites. Figure 4 shows the project logo. Once a speaker is accepted, we promote the events through our pages (website, Facebook, Instagram, LinkedIn and YouTube) using the layout shown in figure 5. A brand-new website was also published in February/2018 and contains all relevant information about the project. Figures 6 and 7 shows the website promotion and layout.



Figure 4. MSP Talks Logo



Figure 5. MSP Talk Promotion Folder

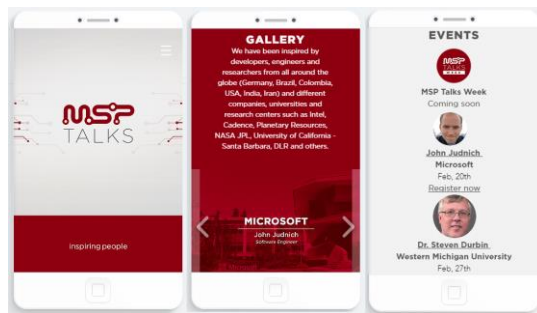


Figure 6. MSP Talks Website (www.msp-talks.com)



Figure 7. MSP Talks Website Promotion

2.2 MSP Talks: Guest Speakers

Through the past year, the project had the pleasure to provide talks with professionals, researchers, engineers and developers from all around the globe. The guests are usually experienced people, similar to the ones from PopTech (PopTech, 2018), a global network of innovation experts. Table 1 summarizes MSP Talks guest speakers. Figure 8 shows the audience related to each of the events. Each guest speaker name is abbreviated with their initial letters. With an audience of only seven students, our first MSP Talk invited Brian Douglas, a systems engineer at Planetary Resources. Audience numbers started growing talk after talk and achieved its climax during the Annual Control and Automation Engineering Week (October/2017). At that week, MSP Talks provided events with two different speakers: Camila Jaramillo, electrical engineer from Intel (audience: 30 students) and Kamak Ebadi, doctoral research fellow at NASA JPL (audience: 70 students). During his talk, Kamak Ebadi invited the audience for an online tour in the Mission Control Center at NASA Jet Propulsion Laboratory. Figure 9 shows the researcher and the audience (top-left). After the talk, Kamak Ebadi expressed his experience through the following message. It describes exactly what MSP Talk project was designed for: connecting and inspiring people.

*"Tonight I had the pleasure of giving a talk via Skype to a large group of bright and motivated students, thousands of miles away in Brazil as they celebrated the Control and Automation Engineering week. It was almost midnight in Brazil, and seeing all those people that late at night asking me about NASA's projects and how they can one day work for NASA was amazing! My hope is that few of them left the room tonight, inspired and believing that no dream is ever too big. Dreams are hard to follow, that is why they are called dreams in the first place, but not all dreams are meant to stay that way, "a dream" for ever. Most of them can come true and will come true, given that we pay what it takes to realize them and never give up. Thanks to my friend, Professor Paulo Victor Padrão for organizing this event. **Kamak Ebadi, Doctoral Fellow Research at NASA JPL.**"*

Carefully analyzing figure 8, one can see that our fifth event (Tin Muskardin, robotic systems engineer at DLR) achieved an audience of 42 students. One of the reasons that could explain such number is that our guest speaker personally visited our institution. Students tend to feel more comfortable with face-to-face conversation and the event was also held in Portuguese, differently from other talks.

Table 1. MSP Talks: Guest Speakers

Guest Speaker	Institution
Brian Douglas	Planetary Resources
Henrique Andrade	neuroUP
Fernanda Braga	Cadence Design Systems
Shriniwas Patwardhan	George Mason University
Tin Muskardin	German Aerospace Center (DLR)
Camila Jaramillo	Intel
Kamak Ebadi	NASA JPL

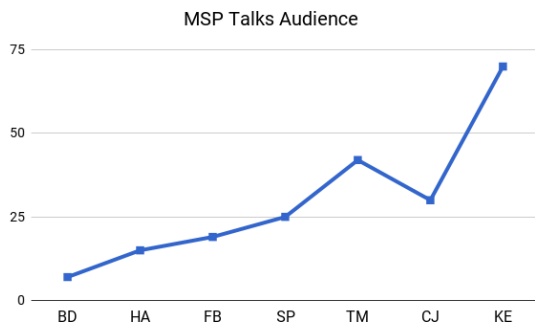


Figure 8. MSP Talks Audience (in terms of students)

3 MSP Talks: Audience Profile and Future Steps

To better understand our audience profile and opinion about the MSP Talks project, we provided a form that was answered by 318 undergraduate students from different engineering and technological courses at Instituto Federal Fluminense (Campus Centro) in October/2017. Another poll is scheduled in April/2018. The results from October/2017 are presented in the following sections.

3.1 MSP Talks: Audience Profile

Figure 10 shows that our audience is primarily composed of five different majors: Control and Automation Engineering (38.1%), Electrical Engineering (22.6%), Computer Engineering (16.4%), Information Systems (12.9%), and Telecommunication Systems (10.1%). As expected, the majority of our audience comes from the Control and Automation Engineering since MSP Talks is a project of such department. However, other main factors contribute to this profile: i) talks are often held in the afternoon or at night. At that time, students from Information Systems and Telecommunication System are either in class or at work; ii) In terms of total number of students, Engineering courses have higher enrollment rates than other majors.



Figure 9. Guest Speaker Kamak Ebadi presenting NASA Mission Control Center to undergraduate engineering students

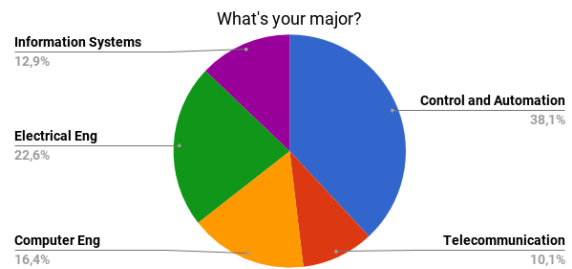


Figure 10. Student's Profile Regarding their Majors

With respect to student's current term, the results show that freshmen and sophomore students seems more engaged than junior and senior ones, as presented in figure 11. Students from 7th to 10th terms are naturally concerned with their final project, internship programs and first jobs. We believe that basic cycle students (1st to 4th terms) take more advantage of the fact that the talks explore topics they have not covered yet in class as well as broaden their expectations with respect to their whole course. In other words, talking with professionals from different areas can contribute to their career path and future academic choices. One of our challenges is to increase senior students' engagement by stimulating partnerships with guest speakers' institutions. Even though this is not the scope of our project, MSP Talks could be the first step towards this goal.

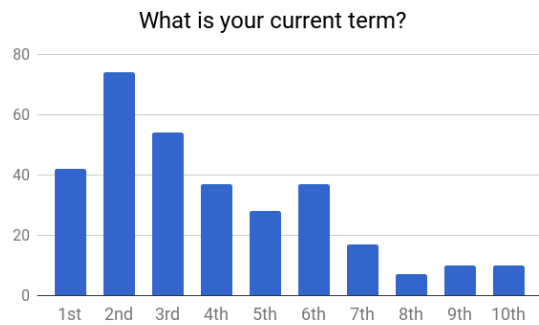


Figure 11. Student's profile regarding their current term

Although our first event occurred in December/2016, the MSP Talks project was only institutionally approved at the end of September/2017. Until then, we focused in promoting the talks exclusively to engineering courses. Figure 12 shows that we need to overcome the challenge of promoting the project to a larger number of students. This could be achieved with the help of our brand new website, social networks and more events.

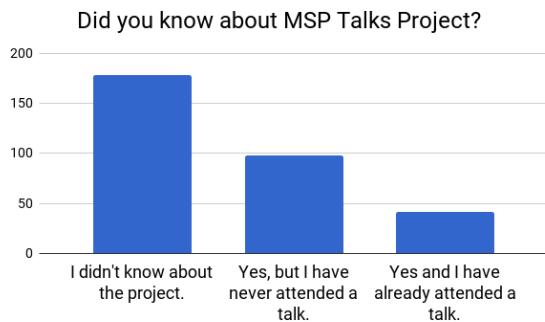


Figure 12. MSP Talks Promotion

3.3 Audience Thoughts about MSP Talks

This section is dedicated to present the audience opinion regarding the MSP Talks events they had previously attended. Figure 13 shows an interesting result: although the majority of students who attended one of the talks considers the event promotion "Good" (39.2%), the portion of the public that considers event promotion either "Poor" (11.2%) or "Very Bad" (2.4%) is higher than the portion that considers it "Excellent" (8.8%). Besides that, a relatively high percentage of students think the event they attended had a "Regular" (38.4%) promotion. It is clear that event promotion plays an important role and needs to be improved as table 2 also suggests.

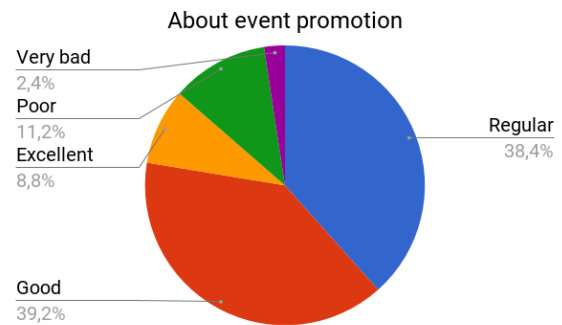


Figure 13. Audience opinion about MSP Talk event promotion

Table 2. Top audience suggestions to MSP Talks events

Top Audience Suggestions
1. Better event promotion
2. Rearrange event starting time
3. Bigger room
4. Partnerships with institutions
5. Record, subtitle and share the event

An outstanding result is presented in figures 14 to 15. According to this group of undergraduate students, the topics covered during the MSP Talk event they participated were "Relevant" (56.4%) or "Very Relevant" (39.6%).

Besides that, the event was "Within my expectations" (60.7%) or "Above my expectations" (35.7%) to the majority of students.

These results show that MSP Talks offers relevant and interesting content to undergraduate engineering students.

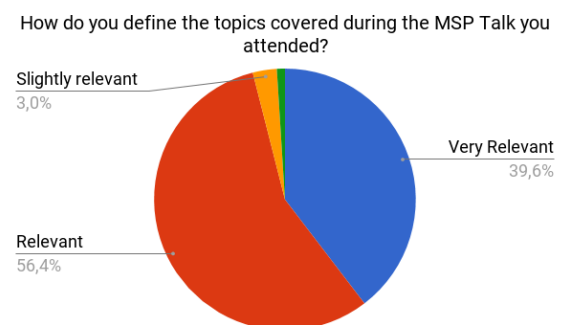


Figure 14. Audience opinion about topics covered during MSP Talk event

3.4 MSP Talks Future Steps

Improving MSP Talks includes – but it not restricted to - the following steps:

1. Extend project promotion to faculty members;
2. Share talks online to reach students from other institutions and campuses;

3. Stimulate partnerships with guest speaker institutions;
4. Annual MSP Talks Week;

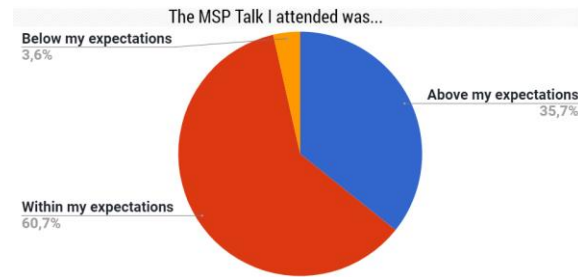


Figure 15. Audience expectations regarding MSP Talk event

4 Conclusion

In times of financial crisis, creative educational strategies are more than welcomed to enhance students' engagement to their undergraduate studies. This article presented the MSP Talks, a project designed by the Mechatronics and Signal Processing Laboratory at Instituto Federal Fluminense - Campus Centro. It consists of videoconference talks with professionals from different parts of the worlds and with different background. Our main focus is to provide undergraduate engineering students a way of getting inspired by people who stands out in the area of engineering and technology. Through a detailed analysis of our target audience, we also developed guidelines to overcome project drawbacks.

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