

NEWSLETTER

TLMOTO
TÉCNICO LISBOA



AUG 2022 / QUARTERLY

Joana Fonseca

We start the Newsletter highlighting a former member of TLMoto, and in this edition, we introduce someone who is very dear to us, not only for her relationship with the team, but also for her achievements. Joana Fonseca made an authentic overhaul of the management department, changing the way TLMoto was seen by its members and by its followers.

Joana was one of the creators of the management department of TLMoto, being the first recruit in this area and the first Business Manager. She has a Bachelors in Biological Engineering and a Masters in Energy Engineering and Management, currently working as an analyst and project coordinator at Hydrogen Europe.

How was your journey within TLMoto?

When I joined, they were restructuring the team, and there were two non-technical areas: marketing and management. I didn't know which one to choose, but as no one else joined either, I ended up doing both. As a marketing recruit, I published on social media, developed the website, created the email. And in management I tried to organize things a little, take care of the logistics, etc. Then, when moving from recruit to member, as there was no one else in the old management team, and as I brought a lot of experience from NAPE, I went directly to management as a Business Manager. In the meantime, I had invited a few more people to do the recruitment and hence we got a marketing and management team with a few people.



How did you find out about TLMoto and why did you decide to join?

I was part of NAPE (Núcleo de Apoio ao Estudante), so I was present in several events with other nuclei and it was there that I first heard about TLMoto. However, I didn't know it very well because they didn't have a marketing team, so they didn't expose the project much. So later, when I left NAPE and was looking for a new challenge, I decided to go to TLMoto because as they didn't have the marketing area so developed, and it was the area I wanted to get into, I thought it was where I could do a bigger difference because I already had some communication experience from NAPE.

Do you think it was difficult to reconcile study with TLMoto?

Yes, it was difficult because I dedicated a lot of my time to the team, also because at the time, with fewer people, there was more work for each one. It was complicated, but it is doable with good time management.

If you had to choose another area within TLMoto, which one would you choose?

If I had to choose a technical area, maybe I would have gone into aerodynamics. They were doing some studies on heat transfer, which is a subject I always liked.

Do you think TLMoto helped you to enter the market?

Yes, I'm sure that's what made the difference. Being in a project management role gave me a lot of experience. I talked a lot about it [the role] in the interview, explained what I had done, what the problems were and how I had solved it, and that was how they realized if I was the right fit for the job or not. In other words, if I hadn't been in the team, I wouldn't even have been able to apply for this position.



What was your biggest motivation for continuing on the team?

There were two things that motivated me a lot: first, I was creating a management and marketing team from scratch and I was doing so well I quickly felt recognition. Hearing people say that they didn't know the project, but that now TLMoto was "everywhere" gave me a lot of motivation to do even more and I was very proud. Then, what motivated me a lot were also the people! From the beginning we had a lot of team building activities and we had a really spectacular team relationship. As we spent the whole day in the workshop, we grew fond of each other.

What skills have you gained with TLMoto?

Resilience, above all. Things weren't going well and so we had to keep persisting until we finally got it right. Time management, communication, improvisation, decision-making and leadership are also skills that have been acquired over time.

Do you think TLMoto influenced you in any way to follow this path?

Yes, without a doubt, because I realized that I wanted something that reconciled the technology area with the management area, and now I found something that consists of a mixture of both. It also showed me that I really liked this area of project management and leadership, and that's the kind of position I ended up applying for. So yes, it helped me to see that I preferred to go into a more management rather than a more technical area.

Can you explain to us what you are doing professionally?

I work at Hydrogen Europe, in Brussels, and I coordinate a project that involves safety at refuelling stations for hydrogen vehicles. I don't do anything in the lab, just coordination. But as this does not occupy me full time, I also work as an analyst in this organization.

Do you have a professional dream that you want to fulfil one day?

My dream is to feel like I'm making a difference in someone's life as a mentor. I would like to feel that I am having an impact on the team around me and one day reaching a level where the experience I give brings value for me to start training other people.

What advice would you give someone who is thinking about joining the team?

The biggest advice I would give is "if you are willing to accept the challenge, take it wholeheartedly", that is, this is an experience that will give you as much as what you give it. If you give just an hour here and there just to say it's on the curriculum, in the end there won't be much to say about what you've learned. But if you give your fullest, you get the experience, the good memories, the trust, and these are things that are worth it later, whether in a professional or

Favorite MotoGP rider?

Miguel Oliveira, of course.

What challenges do you think you encountered while performing as a business manager?

To begin with, many of the things had to be made from scratch. For instance the website: I had to find out how to make one. I also had to recruit people because I couldn't do everything myself. Another challenge was going to the sponsors and trying to get them to sponsor us based on the publicity we could do in the competitions, but I didn't have material from the previous competition to show them, so it was a bit difficult. And, obviously, one of the biggest challenges of all: in the middle of the project came COVID-19. It was a moment of many uncertainties and, without a doubt, very challenging.

If you had to describe your experience on the team in a few words, what would you say?

It was a very rewarding, very intense experience that shaped the way I work and how I relate to a team. It was what impressed me the most at Técnico, without a doubt.



The end of another recruitment process

This family has been multiplying in the last month: a new recruitment process has reached its final stages. Some areas have already welcomed the new members, while others will extend their recruitment until September, where we hope to refresh the team.

The technical areas that carried out recruitment, Electronics, Dynamics, Aerodynamics and Cooling and Structures, are still finalizing this process, while the non-technical areas, Marketing and Design, Logistics, Human Resources and Sponsors, have already welcomed the new members who, after being introduced, participated in a general meeting of the team - the last face-to-face meeting before the vacation period, with the right to a team building activity in which each rookie made himself known.



PROTOTYPE TESTING

With competition getting closer and closer to the team's horizon, the time has come to go ahead with testing the well-crafted TLM03e.

Since the tests carried out at the Ota air base, two more tests were carried out: one at the Alameda campus of Instituto Superior Técnico and another at the Kartódromo Internacional da Região Oeste (KIRO). The tests carried out at the IST premises were intended to test the acquisition of data from the telemetry system and verify that the data were readable and in fact useful.

On the other hand, the tests carried out at KIRO emerged, not only as an opportunity to test the telemetry in a track environment, but also to record the MSV (motorcycle status videos) – a requirement for joining MotoEngineering Italy, testing BMS, monitoring and assess the risk of overheating of powertrain components and, finally, get feedback from the rider in terms of suspensions and aerodynamics of the bike.



PROBLEMS FACED

Making the improvements was not an easy task, however, the team remained united and with their heads held high, confident that we would overcome the problems we faced.

A major problem the team has been facing is overheating, and for that reason, the cooling subarea has been working intensively, in order to ensure that this barrier is overcome, always taking into account the time left for the competition.

Most of the problems that arose consisted of ensuring that the bike complied with the MEI (MotoEngineering Italy) regulations. For this, some changes were necessary: from waterproofing the batteries and changing some types of screws that had to be specific according to the regulations, to solving problems in the BMS, installing a new rear light, rewiring the electronics box and adjustments to the dashboard. to show more information.

IMPROVEMENTS MADE TO TLM03e

There is always room for improvement and our team ensured that the bike we would take to the Italian competition would be a revamped model of the 03, that is, a new version of the TLM03 that was taken to motostudent. For this, it was necessary to solve some problems and adjust some details.

Another improvement worth noting was changing the number of batteries, so that it would better adapt to the controller and we could have more energy available at each charge.

In terms of improvements, we implemented a telemetry system capable of storing a large part of the powertrain, batteries and suspension data. It was also necessary to remake some parts such as the electro box support (box with the PCB's of the low voltage system), footpegs and spare parts and we also implemented driving modes to maximize battery energy and redo and optimize the cabling of the batteries.



MEI 2022- MOTOENGINEERING ITALY

When is it going to happen? What will it consist of?

These are the questions you surely want to know the answer to. Well, if before the competition was still in a distant timeline, now, you live the pressure of it. In order to clarify the curious minds, the competition will start on the 25th of September and will last until the 30th. The following schedule of events will be expected:

SEPT 25 ARRIVAL AT AUTODROMO ENZO AND DINO FERRARI, TEAM REGISTRATION

TECHNICAL INSPECTIONS
COMPETITION'S OPENING CERIMONY

SEPT 26

SEPT 27 TECHNICAL INSPECTIONS AND TECHTALK

DYNAMIC TEST

SEPT 28

SEPT 29 TRAINING SESSIONS
FREE PRACTICE 1 AND FREE PRACTICE 2

CHRONO AND TWO RACES WHERE ALL THE PROTOTYPES' PERFORMANCE WILL BE SHOWN

SEPT 30

EXPECTATIONS REGARDING THE COMPETITION

The big day is a month away and the team's heart is pounding increasingly. If, on one hand we are anxious to see the performance of the TLM03e improved, on the other hand we hope to bring as many people as possible so that, after so much work, the team can share together the feeling of seeing our effort and dedication materialized in a more reliable bike, thus strengthening the team spirit.

In conclusion, entering the top 5 places in the competition and ensuring teambuilding would be the perfect combo for the team, at the end of the big day, to feel fulfilled.

SMARTENERGY

Due to the indispensable and excellent support from SmartEnergy, TLMoto was able to develop work in all areas, enabling the study and advancement in the design of the TLM04e. For that reason, the team is grateful and emphasizes the importance of this company in the team's development and its success.



SMARTENERGY

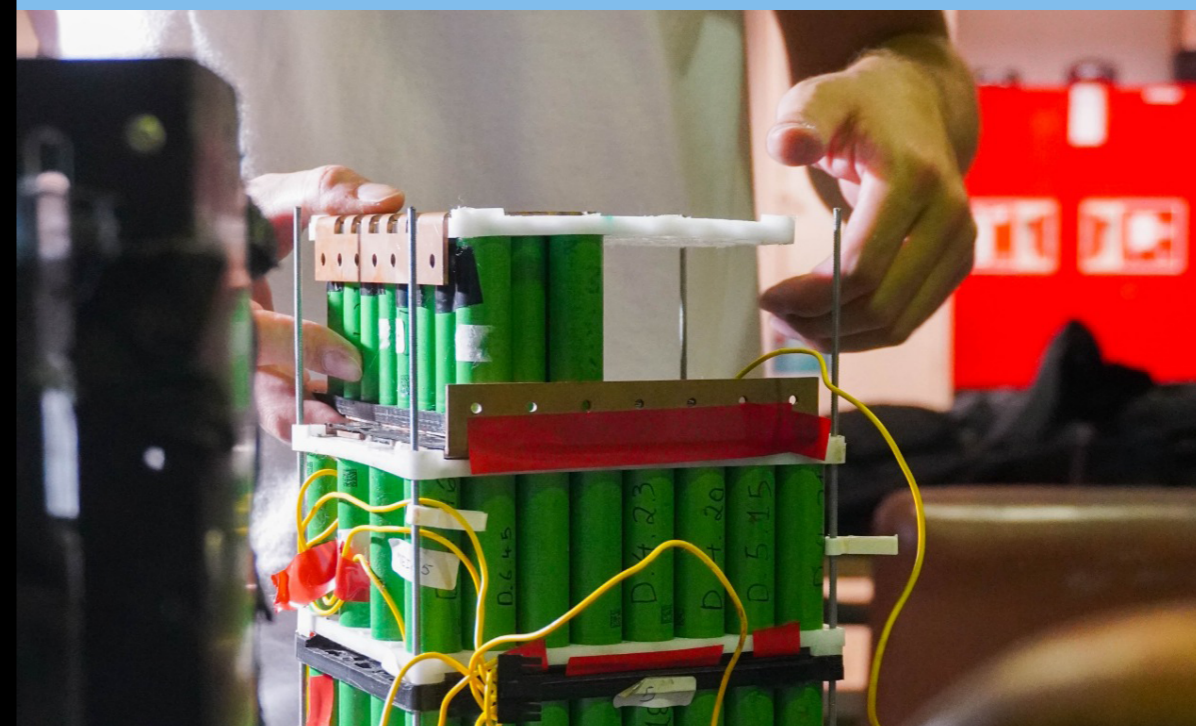
STRUCTURES

In the sub-area of main structures, the concept phase was completed and the design phase started. The most varied concepts for the frame were conceived, in collaboration with all technical areas, from the monocoque to the TLM03e concept.

In the sub-area of connecting parts, the theoretical research reports on the components of the TLM04e have been completed and work has been carried out on the TLM03e. This work involves the improvement of some of the parts previously produced and the preparation of the manufacture of some extra components.

In the sub-area of battery boxes, work has been done on the concepts of TLM04e, a study was carried out for the sectional area of the motorcycle and a research was also carried out on possible methods of fixing between each module.

Finally, in the production sub-area, the last 3 months work was planning the manufacture processes, sketching the bench and the corresponding CAD's were made.



AREAS



AERODYNAMICS & COOLING

In the last quarter, the cooling subarea deepened its knowledge of the water cooling system and developed the TLM03e's cooling system for the next competitions; it was also modeling and simulating its thermal behavior.

The design subarea continued its work on the development of our next prototype - the TLM04e, which consisted of understanding the aerodynamic behavior of the previous prototype and improving the concepts applied to it. New concepts were also designed to be applied in the TLM04e.

POWERTRAIN

In the powertrain department, once again, they were working on the two prototypes. Regarding the TLM03e, certain modifications were made to optimize it, and driving modes (eco and speed limiter) were added and tested. As for the TLM04e, we defined the cell model we want to use, the number of cells and the transmission ratio to use on the motorcycle.

At CFD Development, work continued on improving the efficiency of simulations through various mesh studies – areas of importance and validation of results.

Important research was carried out on the functioning of the cells we work with and on how they should be cooled, and a market study was also carried out to determine which controller to buy. Finally, studies were carried out on the effects of temperature on the engine, to find out what temperature the TLM04e should be at.

DYNAMICS

The dynamics area has renewed the name of its subareas, and is currently divided into the Modeling & Simulation and the Tests & Dynamic Components.

The Modeling & Simulation subarea finished the mathematical verification of the TLM04e's geometric parameters and implemented the magic formula model in the Laptimer program, making it more realistic. The development of the rigid body modeling program, Motus, also began, which will allow the definition and optimization of the geometric parameters of the future prototype, TLM05e, and also to make some optimizations of the current prototype, TLM04e.

In the subarea of Tests & Dynamic Components, there was a research and study about the different software available to model the TLM04e linkage system, starting its modeling. The ideal suspension curve to be used in the linkage system was also defined and places were investigated to test the tires supplied by the competition.

LOGISTICS

The logistics area made great progress in the preparations for the competition in Italy and made some important changes to the workshop – inventory and reorganization. They continued to support the technical areas in preparing trips for tests and in booking rooms and other IST services.

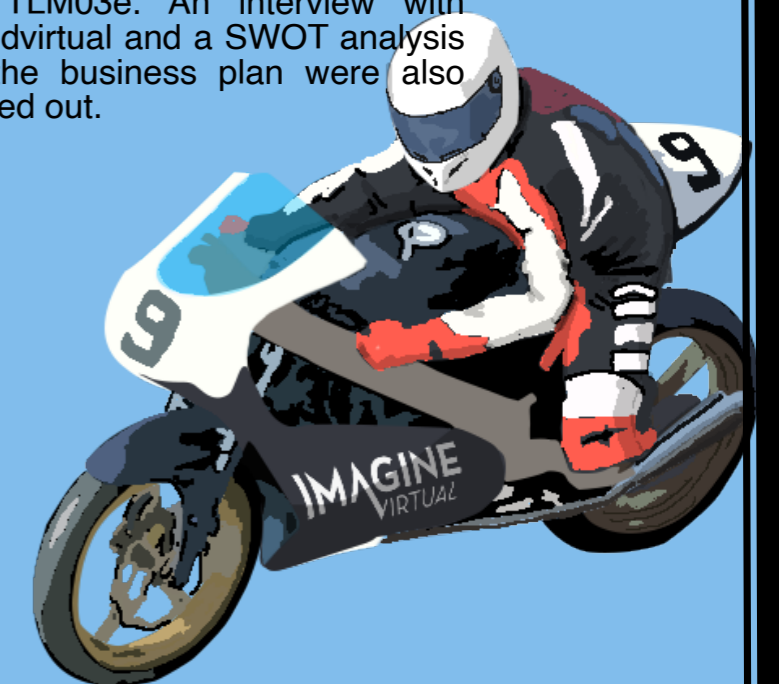
ELETRONICS

The BMS sub-area was divided into two teams: one working on TLM03e and the other starting studies for TLM04e. In the first one, some code adjustments were made for the opening and closing of the HVS depending on the voltages and temperatures of the batteries, and some slave cables were redone. For the TLM04e, the systems that will be needed for a BMS master and the respective slaves are being dimensioned, for all possible battery configurations.

The Telemetry subarea has been busy putting the TLM03e board into operation so that it is possible to obtain data as required by the other areas. An application code has also been developed that will allow us to read the data and create graphs.

SPONSORS

In Sponsors, a partnership was made with Thyssenkrupp, an aluminum producer, which is important for the Structures area. This partnership was particularly important to the development of the team and its prototype due to the massive support that the company offers. Finally, we partnered with eNGN, who will provide us with a new and better charger for the TLM03e. An interview with Standvirtual and a SWOT analysis for the business plan were also carried out.



MARKETING AND DESIGN

In the Design subarea, in the last three months several activities were carried out, some in image editing, some in video and some in graphic design as forms to advertise the team.

Image editing was highly focused on covering events and editing said pictures taken in those events.

On the other hand, video editing was very focused on creating several TikToks and Reels to announce the Newsletter and such, as well as team presentation video, videos about certain members and ex-members about their time and experience while at TLMoto and, finally, a video about Altair to promote the softwares they develop.

PROJECT MANAGEMENT

In Project Management, the inventory was created to record the workshop material to be used by Logistics and the creation and implementation of a credit system for the human resources team to balance the work each member puts into the team in events were the team is present and also manufacture. Also, as a way to improve efficiency and organization of the team, there was also the creation of automatic reminders to send emails to companies for the members of Sponsors and the implementation of a physical schedule and team charter in the workshop. Finally, they started designing an implementation of a procurement system for the team.

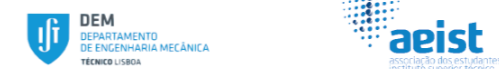
Last but not least, their was also development of business cards, a Sponsor Booklet to present in meetings, the vinils were updated and the calendar was planned.

In the Marketing subarea, the management of social networks was carried out, monthly analysis of the same, a survey for the growth of Tiktok and the dissemination of recruitment. Regarding our merch, contact was made with the supplier and the rest of the team, while the respective development was carried out in Design.

HUMAN RESOURCES

Human Resources dealt with the restructuring of the area: updating of objectives and tasks, creation of 4 sub-areas: people management, training and development, monitoring of areas and recruitment and reformulated the recruitment process used by the team (it became simpler and with a greater focus on candidates' psychosocial characteristics rather than technical skills).

The organization of the entire May'22 recruitment process was also carried out, the programming of the Airtable platform that is used in all HR processes/tasks and the creation and updating of support documents for the team: instructions for appointing a member of the month, task delegation manual, manual of good practices of a member of TLMoto. Finally, it closely monitored the areas (problem solving and support in decision-making in general,



PARTNERS



THANK YOU

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