UNIDAD DE CALIDAD E INNOVACIÓN DOCENTE

Escuela Superior Politécnica
DTIC

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Evaluación de la Docencia del Máster: Computational Biomedical Engineering 2016-2017 Academic Course

Octubre, 2017

Index

1. Introducción

A raíz de la construcción de la Unidad de Coordinación Académica de Ingenierías y TIC (UCA EiTIC), la Unidad de Apoyo a la Calidad y la Innovación Docente (USQUID) ha coordinador un estudio centrado en la satisfacción discente de los programas de máster del Departamento. En este documento en concreto re recogen los resultados obtenidos en el marco del *Computational Biomedical Engineering* en el curso 2016-2017.

El cuestionario diseñado con este fin fue enviado al estudiantado y recogido de manera anónima una vez presentada la tesis de máster. El índice de respuesta es del 100%.

Siguen tanto el cuestionario como los resultados y conclusiones extraídas a partir del estudio.

2. Presentación del instrumento

A continuación el instrumento utilizado para la recopilación de datos e informaciones relacionadas con la satisfacción de la docencia del CBE. Recordamos que este formulario fue aplicado presencialmente.

Teaching Evaluation

Dear Students,
In order to collect your feedback to improve courses and teaching practices we ask you to fill the questionnaire below. It's anonymous.

We really thank you in advance

MÀSTER: _____

Please, mark your level of agreement with each affirmation using the scale 1 to 5, being 1 totally disagree with and 5 fully agree with

	1 (totally disagree)	2 (somewhat disagree)	3 (neither agree or disagree)	4 (somewhat agree)	5 (fully agree)
I think that, in general, the **courses** were useful					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
I think that, in general, the **courses** were well prepared/presented					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
I think that, in general, the **practices/labs**, **seminars and other educational activities** help me to understand the theory worked in lectures					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I think the master was well **coordinated**					
Please, add here any other information/comment and suggestion about the master coordination:					
I think that, in general, the **academic resources** provided during the course (material, labs, equipment) were suitable to support my learning process					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					

I think that, in general, the **educational resources** by UPF (Library, Aula Global System, etc.) were suitable					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the **tutorship advice received <u>before</u> the master started** (e.g. in choosing elective courses)					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the **tutorship advice and the support by the master coordinator**					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the **support and attention of the secretariat**					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the **supervision on my master thesis**					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					

What did you like the most and the least about the master?

Which are your professional perspectives/intentions after finishing the master? (Do another master, continue your academic career with the PhD, work in a company, you don't know…). **Please, explain us your answer.**

3. Resultados obtenidos

En esta sección se presentan los resultados obtenidos a través de la aplicación del instrumento. Se consiguió la participación de 9 estudiantes que suponen el 100% de los matriculados al CBE que finalizaron completamente el máster -incluyendo la defensa y superación de la tesis de máster, en el curso 2016-2017.

Para la presentación de los resultados se seguirá el mismo orden de preguntas del propio formulario. Asimismo se presentarán en inglés tanto los ítems recogidos en el formulario como citas textuales extraídas de los formularios recogidos para ser lo más fiel posible a los datos.

Todos los ítems fueron presentados en forma de afirmación, solicitando al estudiantado que indicara su grado de acuerdo utilizando la escala de 1 a 5, siendo 1 en total desacuerdo y 5 en total acuerdo.

El primer item era: "**I think that, in general, the courses were useful"**
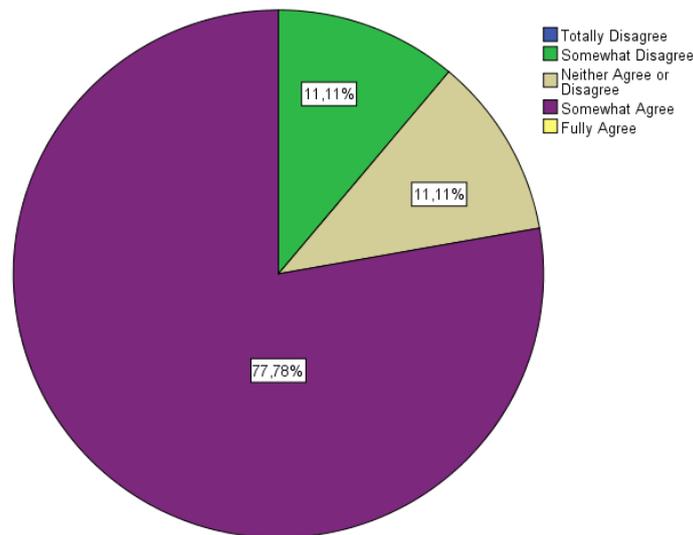
Comentarios cualitativos respecto este primer ítem:

- Material provided by professionals investigating/working on the topic with state of the art knowledge.
- Some courses had a c content poorly programmed: not clearly differentiated modules or no clear relationship between modules and practices.
- I consider the content some of the courses offered in the first and second trimesters was somewhat useful, however no very extensive.
- I would suggest reducing the number of topics contained in the subjects and to explain more details of the remaining topics
- I think that the most of the courses were useful and I consider that I learnt from them.
- Data science was really useful in terms of the topics of the course, however I think that the course was either too short to cover all the topics deeply or either there were many topics. I would suggest changing a bit the schedule to favor this.

- Complexity science has been one of the course that I have enjoyed the most. However, the course started later than the other first trimester courses, which wasn't optimal to fully understand all the concepts.
- Research methodologies, this is one of my least favorite courses as I had covered most of the lessons contents in previous courses.
- Compu. Cardiology, I enjoyed this subjects as I already been in contact with some of the topics of the course. However, I think that the course was a bit chaotic regarding the schedule. I think that adding some lab sessions on the course could be better for the overall experience and learning-.
- Comp. Therapies was a nice subject and the topics covered were really interesting. However the laboratory sessions in which we had to develop a tool programming in C++ was too complicated for students that did not have any previous knowledge of C++. I could suggest doing different lab sessions.
- Computations biolectromagnetism, the theoretical part of this subject was a revision of electromagnetism, which was sometimes dense and useless. However, the lab sessions were very interesting and learning to use the software com0oll was very useful.
- Some of the courses were not as useful as I expected: computation therapies (lack of background), Computational cardiology (not any real new skill).
- The courses were not useful for the development of my thesis as it was mainly software development. However, some were interesting such as the Complexity Science one. Expected to see more advanced content in them though, the courses were somewhat low on difficulty and complexity.

El segundo ítem recogido en el instrument decía: "**I think that, in general, the courses were well prepared/presented".**
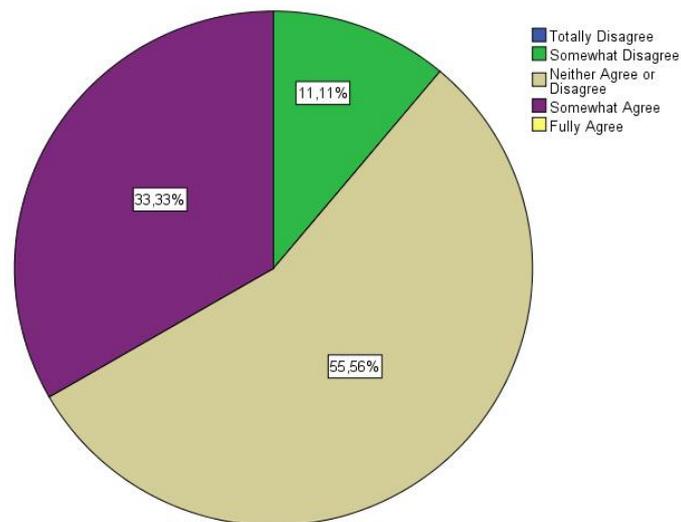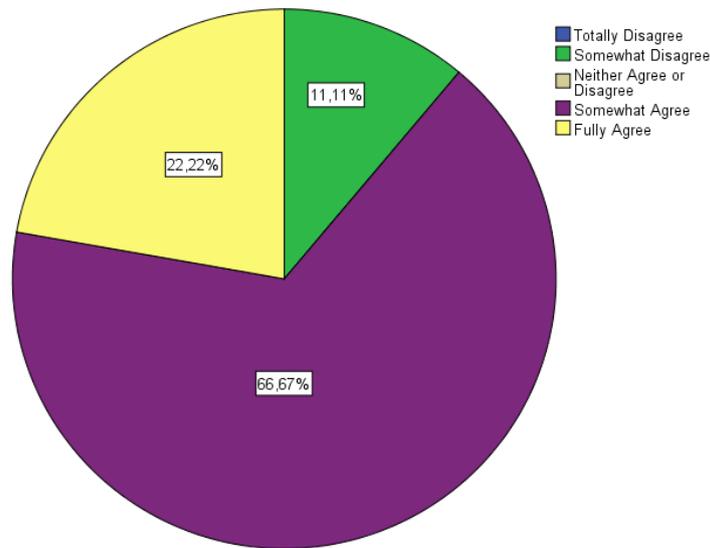

Comentarios cualitativos:

- The course on image guided surgery was too disorganized and treating the concepts only by their surface. It could have been much more interesting.
- Despite having stat of the art content, some subjects were a little chaotic.
- In the case of the subjects in the first trimester, they were very good prepared. Nevertheless, some of the subjects were not very well organized. For instance, in Computation Therapies neither the structure of the subject nor the evaluation criteria were defined at the beginning of the subject.
- Professors tried to remove work load due to the comments that we suggested in the first trimester, however I think it was too much. In the case of Computational Cardiology, we didn't have any experience with any of the computations tools that we studied in the lectures.
- Not clear evaluation criteria on Computational therapies on the beginning of the trimester.
- Except for Computational Cardiology: was kind of a mess, the content had not a well-thought order, the schedule was completely arbitrary and Master students were not always communicated about cancellations/re-scheduling of courses.
- Courses such as Data Science and Complexity Science were well thought and organized. However, other ones such as Computation Therapies were kind of a mess in terms of communication among the different parts, and the correlation between theory and practice sessions (for example, requiring Biomed students who have not programmed a lot to implement things in MITK is kind of a suicide mission).

El tercer item: **"I think that, in general, the practices/labs, seminars and other educational activities help me to understand the theory worked in lectures"** y los comentarios cualitativos recogidos al respecto aquí:
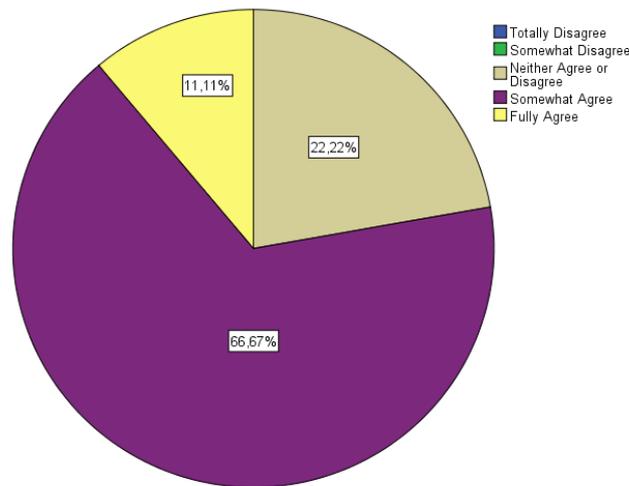
- Despite all practices and labs being interesting and constructive, some were not clearly related to the module's material.
- I think that the practices taken in Data Science, Complexity Science or Computational Bioelectromagnetism helped me to understand most of the content of the subjects. In the case of Computationl Therapies, we had a practice in which we were asked to program in a language that most of the students had never touched. This made the practice less useful for the ones that didn't know the programming language, since we were mainly focused on trying to write a line of code.
- I would suggest designing practices that are accessible for all the students and at the same time useful and related to the subject.
- No practices for Computation Cardiology, which would have helped for sure the understanding of the subject.
- It was not clear what we had to do in Computational Therapies lab, it should be specified that C++ knowledge is needed for the first lab.
- Not many insights needed to be applied in Advanced Biosignal analysis lab.
- Especially on Data Science/Complexity Science, the labs were very informative and well prepared and helped quite a lot. On other courses such as Computational Therapies, the labs didn't help that much (redoing the same things I was doing for my thesis but at a more basic level), or Advanced Biosignal Analysis (wanted to learn about advanced biosignal analysis, quimera states, how to use surrogates, and see more advanced algorithms, not programming a data visualize in Matlab).

El siguiente ítem **"In general, I think the master was well coordinated"** se distribuye según la respuesta de los participantes de la siguiente manera:

Comentarios cualitativos:

- I consider that the coordinator put a lot of efforts to making this master as good as possible for a first iteration. I strongly agree with the decision of being a member of the evaluation tribunal of the master theses, ensuring a fair grading for the students.
- I think that more members of the faculty of the master should play a more important role in the master coordination. Such as other investigation group coordinators.
- Syllabus of each subject should be available before their election by the students. Only one short paragraph was provided and we did not know its exact contents not previous knowledge requirements.
- The master was well coordinated in a general scope, however it seems to me as if the different subjects/departments do not have a lot of communication between them and the master felt a little bit spares, just working on our thesis on our won and didn't really feel like we had actual subjects, didn't feel we were part of a "group" with the other students, just working on our things, we need more team building, coordination between subjects. First trimester was glorious, we had subjects that took a little bit of our time and we were 12 students working together, second and third trimesters no one was actually there.

El siguiente ítem del cuestionario decía **"I think that, in general, the academic resources provided during the course (material, labs, equipment) were suitable to support my learning process"**, y la distribución de las respuestas es esta:
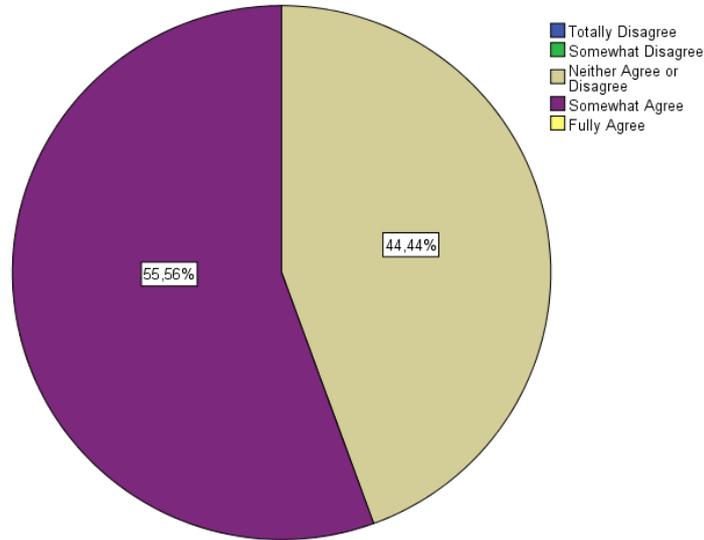
Comentarios cualitativos:

- Some of the assignments required certain software that need to be installed in our own computers and then they did not work (Computational Therapies).
- Yes, but mainly provided by my thesis supervisors.

En cuanto a **"I think that, in general, the educational resources by UPF (Library, Aula Global System, etc.) were suitable"**:
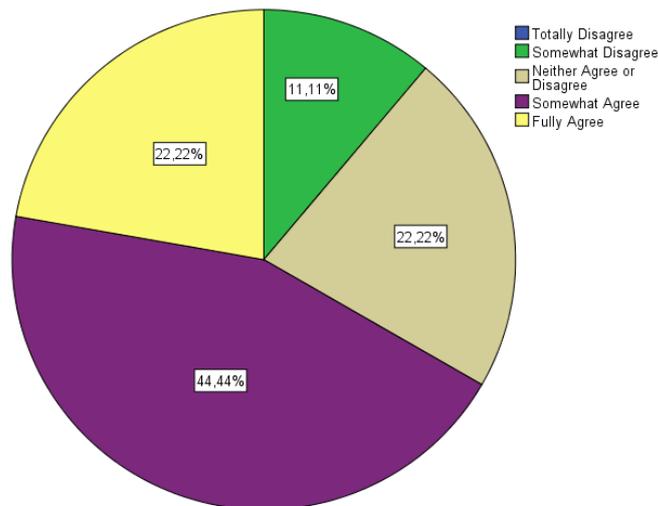
Comentarios cualitativos:

- Some of the tasks of the master program could not be done in certain computer rooms because the computers available were extremely slow. For being a technological campus some computer rooms are the a bit outdated.
- Some information in UPF website is only Catalan. Therefore students from the rest of Spain as well as international students might have some difficulties to access this content.
- Suitable but did not really look at them that much, a lot of teachers simply did not put resources on the Aula Global, was kind of useless.

En lo referente a **"In general, I am satisfied with the tutorship advice received <u>before</u> the master started (e.g. in choosing elective courses)"**:
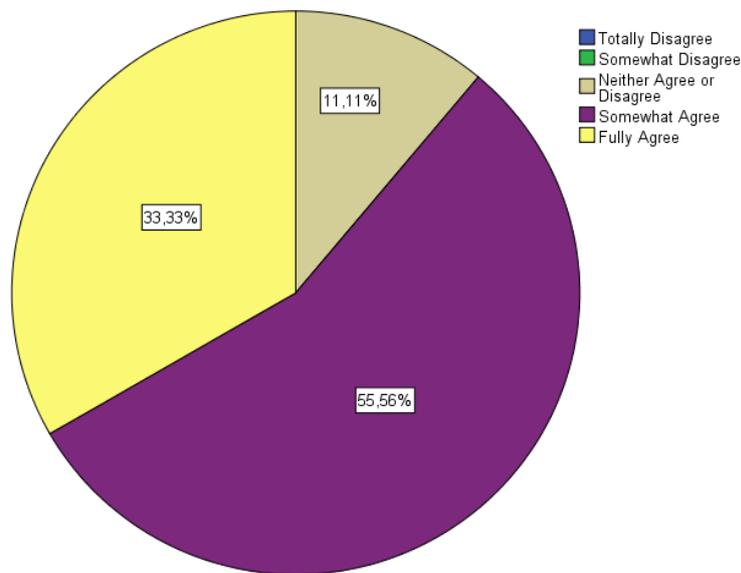
Comentarios cualitativos:

- The professors offering the master theses, kindly solved all the doubts that we had in terms of the project that they offered and the subjects they recommended to be coupled with their theses.
- However, the subjects were not very well described in the master web page, so I could suggest providing further information about the courses.
- I think that students do not get all the necessary information before starting the master. Especially regarding the master Thesis.
- I would have appreciated more information regarding the requisites for the elective courses.
- The tutorship advice before the masters was super good but as the courses were still on development there was not any reference on what to expect on them.

El siguiente **"In general, I am satisfied with the tutorship advice and the support by the master coordinator"**:
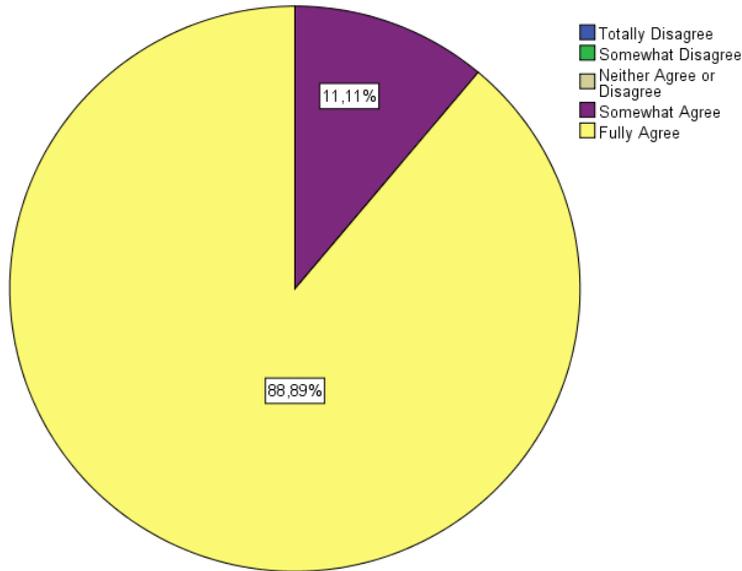
Comentarios cualitativos:

- I am strongly satisfied with the advice and comprehension that the master coordinator has provided the students during the whole year.
- I would like to thank the master coordinator because he was great coordinating the master. He was by far the most supportive and enthusiast member of the faculty. Thank you very much.
- I am satisfied.

El cuestionario incluía un item referente a la percepción de apoyo por parte de la secretaría, aquí la formulación y resultados. There was also an item related with secretariat, concretely it says **"In general, I am satisfied with the support and attention of the secretariat"**.
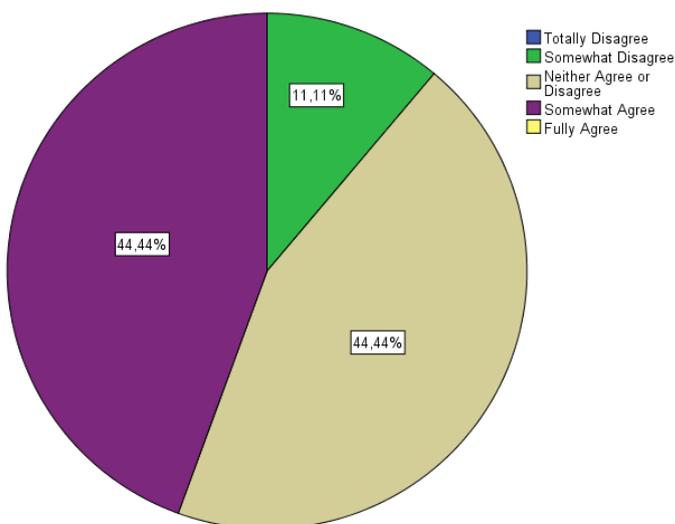

- In my undergrad university the secretary was in charge of communicating and posting the examination dates as well as the results. If in UPF is the same case, communication

of examination dates were very lame (students had to beg to find out the official date), as well as communication of course/assignment grades.
- Took them quite the long time to change subjects form the other masters, but I hate bureaucracy myself so I am kind of biased on that one.

El último ítem decía **"In general, I am satisfied with the supervision on my master thesis"**, and its results are:
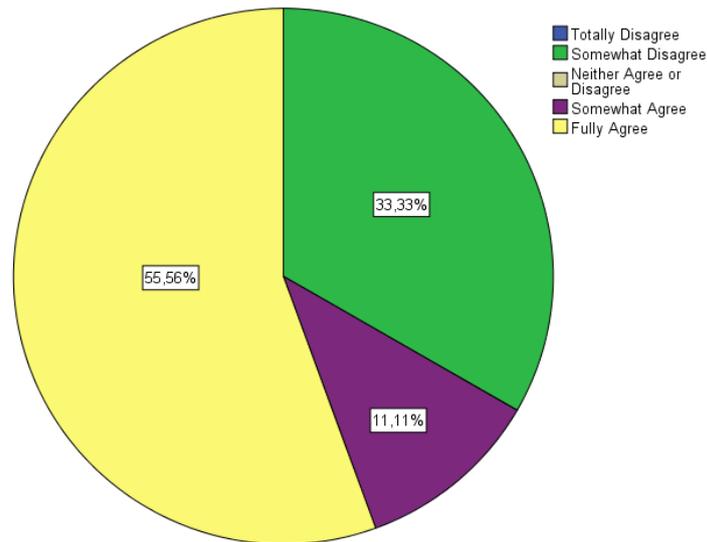
Comentarios cualitativos:

- For the improvement of the supervision o f the master theses, I would like to suggest a higher control over the number of students that are under the supervision of the same person, either as a supervisor or co-supervisor. In my case, at the beginning of the course, me and several students selected theses form the same supervisor. However, since "legally" a professor can only be the supervisor of two students, the rest of us were assigned different supervisors that could act as our "official" supervisor but unofficially the other professor would be the one in charge of supervising all of us. In my opinion, improving the control over the number of students being supervised or co-supervised by the same person could reduce the work load for that person, thus allowing the supervisor to equally attend all the students, such as solving doubts, answering emails, or giving feedback to the written report f the thesis. In my case, this difference would have strongly improved my experience, to which I do not totally disagree since my "official" supervisor made some efforts to support me and my work.
- My relationship with my master supervisor has been a relation of boss-employee rather than tutor-student. I haven' felt supported in many occasions. I also lost interest for my master thesis and had become my worst experience of the master. The main reason for this was that my tutor and I did not get along and my background was not fulfilling the requirements that my tutor expected from me. I would suggest that future students could spend some time in every investigation group offered by the master to know a bit better the people involved in the group and the type of investigation it is being done. One very positive aspect is that I learnt a lot by myself.
- I am satisfied with my coordinators, he is super cool and awesome guy and provided me with infinite knowledge about software development, etc. However, I think that on a general note they were a little bit absent sometimes, and that is completely understandable as they are super busy guys and they just do not have the time to

dedicate solving all the questions as they are either away or tangled in other projects. It would have been great (and I do not know the policies about MSc. Thesis supervisors), if the people supervising the thesis were not senior researcher, but a senior researcher and a PhD student or postdoc. That would have been much better in my case as I think that a PhD/postdoc student can found that I was completely alone doing my thesis, so if the theses were supervised for a postdoc/PhD student and maybe integrated into their projects into a kind of a "team project" where you could help each other, could be ideal, all in all in teaches you work in a group and the supervision would be better, working with another young person that can help you anytime and understands your struggles. Another suggestion: I know NTSA work like a charm in terms of organization, perks of small group, but SimioSys and PhySense lack a little bit of communication between the differ3ent projects and among departments. Having a Google calendar where people tells when they will be at the office/out of office would be great, when can be expect someone to be there or not.

En format de pregunta abierta se les pidió que indicaran **what they liked the most and the least** del máster (**most**, **least**), y las respuestas, según el caso, fueron las siguientes:

- The **most**: I liked the freedom and possibilities of self-organization because I could do several parallel activities in parallel that will also help in my future careers. Also liked the practice-oriented philosophy, I think I've learned a lot in the practices and in the master thesis. What I liked the **least** was having the feeling that some subjects, like "Neuroimaging methods", could be much more interesting that what they finally were.
- The **most**: working hand in hand with researcher in stat of the art projects. The **least**, lack of planning in some subjects' program.
- The **most** the content of the subjects offered in this master and the possibility to be immersed in a research group. My experience with the master thesis was the think that I liked the **least** about the master.
- My favorite part of the master (**most**) has been knowing a new city, new people and increasing my computational knowledge. My **least** favorite part was the master thesis.
- I liked its **aim to research, working the whole course on the master's thesis project.** However, it could be **distributed** differently, since I felt much **pressure** on the first trimester to work on many subjects and also on the master thesis. I believe it would be better to let the first trimester to be an introduction to the master's thesis, getting acquainted with its subjects and the team, while focusing more on subjects. Then, the students can focus more on the by the second term, where he/she already knows what he/she will be doing. Also, **the subject load was unbalanced since we had much more on the first trimester**. Then, we "complained" about it and the second trimester was much quieter. Therefore, we had time for the master's thesis but eh subjects were kind of empty (e.g. no lab sessions on Computational cardiology). I believe that the load charge on the second trimester should not have reduced, but redistributed, doing four subjects on the first trimester and two on the second. This way the master's thesis load would be increasing along the course.
- I liked the **most** working on my Master Thesis, it was a real challenge and I had all the necessary support. The **least** is that some courses did not satisfied my expectations and in some cases (computational cardiology/therapies).
- The **most**: some of the subjects were very interesting and useful (Data science, Biosignal analysis). The fact that the master is research focused also helps your learn a lot about one specific field. The **least**: some of the subjects were not well-organized and the contents not well-structured. During the first trimester the workload was too heavy and there was no time to work on the thesis.
- What I liked the **most** is the wide range of topics that one can focus on, making the entire experience of the masters different. For instance, I am doing surgery planning, but other student is doing fluid simulation on models, or machine learning, or signal processing or

electronics! This is good because the masters can output very different profiles. As a real example, another student and myself are working on the same startup company, but on completely different things, I am focused on visualization and interaction with neuroimaging data and the is building algorithms and pipelines, so the master is very flexible in that regard and two students out of it might have completely different expertise field despite studying the same. What I liked the least is that it did not encourage students to be as a group and was kind of "each one their own way", also the subjects were kind of bland in terms that we did not really learn a lot from it (I fell I only really learned something challenging in Complexity Science). Wanted to learn more about modeling, signal analysis, etc, but the subjects fell short just to give more time to the thesis which we did not dedicate that much time as on the first trimester we were getting acquainted to the technologies and started doing more embedding work with young researches. What I mean is having more difficult projects and challenges with more help and collaboration instead of working basic, not that interesting or meaningful projects in which have the work is starting to get things and technologies figured out as you are alone working on this while other member from the group could do what you did in 4 months in 2 days because he has found the problem to it before.

Y por último se les pidió que nos comentaras cuáles era sus perspectivas/intenciones una vez finalizado el máster**: "Which are your professional perspectives/intentions after finishing the master?** (Do another master, continue your academic career with the PhD, work in a company, you don't know…). **Please, explain us your answer.**

- I'll continue in a **company** (preferably a start-up) because I want to see how theoretical concepts are applied in real life and explore the world of entrepreneurship. I found that investigation was not the kind of activity I would prefer to continue with. It is a slow and dedicated process that doesn't match with the type of activities that I'd rather do.
- After finishing the master I could like to **work either on a company or a research group**, but I am not interested on continuing my academic career through a PhD.
- I am almost sure I could **not continue my studies with a PhD** but beside that, I do not have anything clear.
- I have applied to do **PhD**.
- I will continue my academic careers with **PhD** in a Neuroscience center in Bilbao.
- I would like to **work in a company**, where the results of my research are immediately useful and can be applied directly to solve and existing problem.
- I am currently a visualization engineer at Mint Labs Inc, doing Virtual Reality (**company**), new methods for visualizing neuroimaging data and algorithm and pipeline results. I feel the startup environment suits me better than academia, and did not really want to go to a big company.

Conclusiones

Los resultados de la evaluación muestran un nivel de satisfacción global por parte de los estudiantes positivo en todos los temas incluidos en la misma.

Animamos a la coordinación y profesorado a leer atentamente este documento y a reflexionar sobre los resultados obtenidos para seguir trabajando con el objetivo de alcanzar una mejora continua en cuanto a la calidad de la formación.

La Unidad de Apoyo a la Calidad y la Innovación en la Enseñanza (USQUID) ofrece su ayuda en caso de que los coordinadores y/o profesores deseen llevar a cabo cualquier acción relacionada con la calidad/innovación.