

Teaching portfolio

1. Teaching CV: A list of teaching and supervision tasks, including specification of academic fields, scope, level (bachelor, master, continuing education, PhD). Please state the teaching method used (e.g. lecture, class teaching, exercises, supervision, examination, coexamination, distance teaching, internet-based teaching and evaluation of teaching). Please also indicate the language of instruction.

2.1. Areas of responsibility I have teaching experience in three different universities: University of Granada (UGR), where I got my PhD; University of Aalborg (AAU) where I did a post-doc and I was introduced to Problem Based Learning method; and University of Almería (UAL) where I've been principal investigator and assistant professor during the last four years.

Bachelor Courses •Computing in Environmental Sciences degree. UGR, 2006. 5,5 ECTS . 30 participants, in Spanish. Role: tutoring practical exercises. •Computing and Data Bases in Library Science degree. UGR, 2007 and 2008. 5,5 ECTS each year. Around 30 participants each year, in Spanish. Role: tutoring practical exercises. •Intelligent Systems in Telecommunications Engineering. UGR, 2010. 8 ECTS. 60 participants, in Spanish. Role: Course supervisor, lectures and tutoring practical exercises. •Data Bases 101 in Computer Science degree. UGR, 2010. 3 ECTS. 50 participants, in Spanish. Role: Course supervisor, lectures and tutoring practical exercises. •Statistics 101 in Computer Science degree. UAL, 2018 and 2019. 5,5 ECTS each year. Around 80 participants each year, in Spanish. Role: Course co-supervisor, lectures and tutoring practical exercises. •Statistics 101 in Economics degree. UAL, 2018 and 2019. 3 ECTS each year. 40 participants each year, in Spanish. Role: Tutoring practical exercises. •Reliability and Risk Management in Computer Science degree. UAL, 2018. 5 ECTS. 10 participants, in Spanish. Role: Course supervisor, lectures and tutoring practical exercises. •Statistics 101 in Environmental Sciences degree. UAL, 2019. 2,5 ECTS. 60 participants, in Spanish. Role: tutoring practical exercises. •Statistics 101 in Tourism degree. UAL, 2019. 5,5 ECTS. 80 participants, in Spanish. Role: Course supervisor, lectures and tutoring practical exercises. Student Guidance •Predicting the Outcome of League of Legends Matches using Machine Learning on Big Data. Master Thesis. AAU 2015. Unique Supervisor. Supervision using the Problem based Learning approach. •Optimizing Item Shopping for League of Legends using Machine Learning. AAU, 2016. Master Thesis. Unique Supervisor. Supervision using the Problem based Learning approach. •Missing Data Modelling with Variational Inference, Master project. UAL, 2019. Master Thesis. Co-supervisor. Examiner/censor •Member of the Assessment committee of 3 PhD students: University of Granada (02/11/2016 and 24/6/2020) and University of Castilla La Mancha, Albacete, Spain (3/05/2019). •Member of the Assessment committee of Bachelor Final Projects in June and September 2020. Courses at International Summer Schools •Variational Inference in Probabilistic Programming. Nordic Probabilistic AI June 2019, Trondheim (Norway). Materials at: https://github.com/PGM-Lab/probabilisticAI_tutorials •Probabilistic Programming with Deep Neural Networks. Autumn school on Machine Learning, October 2019 in Tbilisi (Georgia). Materials at: <https://github.com/PGM-Lab/ASML-Tbilisi> •Probabilistic Machine Learning with the AMIDST Toolbox. Geilo Winter School, February 2018 (Norway). Materials at: <https://github.com/andresmasegosa/GeiloWinterSchool2018>

2. Study/programme administration and management: Experience in programme management and coordination. A list of study administration tasks, e.g. study board membership, chair of study board, semester or course coordinator, accreditation tasks, etc. Experience in planning teaching activities. Experience in programme development. Participating in committees and commissions etc. on education issues.

Semester Coordinator: - Bachelor in Software, 2nd Semester, 2022 - Bachelor in Software, 2nd Semester, 2023

3. Formal pedagogical training: A list of completed courses in university pedagogy, PBL courses, workshops, academic development projects, collegial guidance and supervision, etc. Written assessment from the course in university pedagogy for assistant professors. Participation in conferences on pedagogy and didactics. Please enclose any documentation of the above, such as course certificates, references, etc

•"Teaching in Multicultural Class" in 2005, 25 hours. This course aimed to encourage the reflection on the presence of students in the class with very different backgrounds (see Appendix 2). •"Pedagogical Adaptation Course" in 2005. 180 hours. This course is required by Spanish authorities to teach in high schools and vocational training centres. During this course, I received general training in Psychopedagogy. It was completed with teaching practices in a local high school (see Appendix 2). •"Introduction to Problem Based Learning" in 2015 at Aalborg University (AAU), 10 hours. This introductory course was addressed to those supervising groups of students working on master/bachelor theses. The course provided training in the problem base learning methodology, which is the main teaching approach at AAU. I applied this methodology when supervising two master thesis projects. (see Appendix 2). •"Internal Seminar on new pedagogical trends" in 2017 at the Department of Mathematics of University of Almería, 3 hours. Taught by Jose Antonio Piedra, Associate Professor, Department of Computer Science, University of Almería.

4. Other qualifications: Conference contributions and attendance, contributions to debates, scientific articles on pedagogical issues etc. Peer supervision, editorials, mentoring experience or other types of competence development activities.

Morales, M., Salmerón, A., Maldonado, A. D., Masegosa, A. R., & Rumí, R. (2022). An Empirical Analysis of the Impact of Continuous Assessment on the Final Exam Mark. *Mathematics*, 10(21), 3994.

5. Pedagogical development and research: Development of new courses, teaching materials, teaching methods, examination types or other types of pedagogical development. Didactic and pedagogical research. Cooperation with external collaboration partners.

I'm currently participating in a pedagogical development project with other professors from the department. The project is entitled "Active methodologies in courses of the area of Statistics and Operations Research". The main goal of the project is to introduce and study the impact of active methodologies on the performance of the students following different courses taught by the members of project. The main active methodologies which are being used are Flipped Classroom, the case method of learning, and gamification. In my case, I started to apply simple gamification strategies in my 2019 teaching courses (see Section 3). I also informally introduced the Flipped Classroom approach during the 2020 courses due to the pandemic situation as the lessons were online. A first output of this ongoing project is an evaluation of the impact of the case method of learning on student's performance in Advance Statistics, a course of the Economics' bachelor degree. A poster was presented at a university workshop on teaching innovations (see Appendix 1). The main conclusion was that the introduction of the case method of learning was associated with a significant improvement in the final scores of the course.

6. References on your teaching skills from superiors or colleagues. Teaching evaluations and any teaching awards received.

I list here the different institutions that evaluated my teaching activities: •University of Granada (Spain): This evaluation covered my teaching duties at this university from 2006 till 2010. The result of this evaluation was "Excellent" with a score of 88,9/100 points (see Appendix 6). My teaching competences were evaluated across four different dimensions: 1. Teaching planning – Score 4,5/6 points. 2. Teaching development – Score 46/54 points. 3. Students' evaluation – Score 5,5/7 points. 4. Improvement in teaching activities – Score 33/33 points. •National Evaluation Agency (ANECA): In 2012, I also got a national accreditation for working as an assistant professor in Spanish universities (see Appendix 7). This accreditation was issued by the national evaluation agency ANECA, which independently and anonymously evaluates the research and teaching activities of Spanish university professors. •Regional Evaluation Agency (DEVA): In 2020, I got a positive evaluation for this independent agency of my teaching activities in my whole research career. This positive evaluation is associated to a salary complement. •Univeristy of Almeria: Unfortunately, I can not yet ask for an independent evaluation of my teaching activities at the university of Almería because I can not be evaluated until I have at least 5 years of teaching experience at this university. The only assessment I have for teaching activities in the last two years is the students' evaluations. The next two figures show the scores I got, on average, for the different courses taught at my university. Each bar detail the assessment I got along 11 different dimensions: Evaluation Items (Maximum score per item is 5 points): •IT1: The teacher reports on the different aspects of the teaching guide or program of the subject (objectives, activities, contents of the syllabus, methodology, bibliography, evaluation systems, ...). •IT2: The teacher conforms to the course planning. •IT3: The teacher organizes the activities carried out in class well. •IT4: The teacher explains clearly and highlights important content. •IT5: The teacher is interested in the degree of understanding of their explanations and solves the doubts that arise. •IT6: The teacher exposes examples in which the contents of the subject are put into practice. •IT7: The teacher fosters a climate of work and participation through fluent communication. •IT8: The teacher motivates students to be interested in the subject. •IT9: The teacher is respectful in dealing with students. •IT10: The activities developed (theoretical, practical, individual work, in groups, ...) have contributed to achieving the objectives of the subject •IT11: I am satisfied with the teaching work of this teacher.

7. Personal reflections and initiatives: Here you may state any personal deliberations as regards teaching and supervision, any wishes and plans for further pedagogical development, plans for following up on student feedback/evaluations, etc. Personal reflections on your own pedagogical practice, including objectives, methods and implementation. This should include an analysis and a reasoned description of your pedagogical activities in relation to your pedagogical understanding and student learning. Thoughts on the teaching method at Aalborg University (which is largely based on group-organised project work and problem-based learning)

Teaching Practice and Reflection: Statistics 101 in Computer Science bachelor's degree. UAL, 2018 and 2019. Spring Semester. Supplementary material in Appendix 3: Students' Evaluations and example of a Practical Exercise. Course's background This is a course for first year students in the computer science bachelor's degree. Traditionally, this course is not very popular among these students because of the high mathematical content (in comparison with other first year

courses) and because of the (apparently) non-computer related nature of the course. Student's motivation I spend the majority of the first lesson (1.5 hours) showing the students the potential applications of the course's contents to real life problems. In 2019, I put a special focus on data science/big-data applications such as sport analytics or political campaigns (Obama 2012). Student's evaluations seem to acknowledge that: I got a score of 3,63/5 in 2018 and of 4,05/5 in 2019 for item number 8, which evaluates students' motivation. Lesson's activities I introduce different kind of activities during my lectures, to test if students have grasped the concepts and to make the lessons more dynamic and attractive. Interactive quizzes using the Kahoot/Blackboard platform are very welcome by the students. Using them, I can test if the students have at least an intuitive understanding of the key concepts of the lecture. And if I find that a given key concept hasn't been properly understood, I proceed to explain it again using new examples. Doing practical exercises in groups is another one of my most utilized teaching activities. I ask students to form groups of 4-6 students. During the activity, I move from one group to another, answering questions and observing the dynamics of groups. One can see that stronger students help weaker students to better understand some of the concepts (which is quite positive for both). Also, I can easily find which concepts were harder to understand and I then come back to the blackboard to explain them again. In 2019, I started to use a simple gamification strategy. For each exercise, I detailed the scoring scheme of the exercise (usually composed of several parts increasing in complexity), and specifying the number of points each group could score for being first, second, third, etc. in providing the right answer. From my experience, the competition fostered collaboration within the groups and, usually, made students work harder because they wanted to be the winning group of that lesson. Appendix 5 contains the template used in one of these activities. Students' evaluations seem to correlate with growing positive feedback from the students. The score of item number 10, which evaluates the quality of the activities, went from 3,85/5 in 2018 to 4,05/5 in 2019, even though the second part of course in 2019 was online due to the pandemic (and it was much more challenging to carry out these activities). Students' grades In 2018, the first year I taught this course, I followed the same evaluation procedure used in previous years, mainly based on a final exam. But only 30,3 % of the students who signed up for the course passed it. Previous years had similar pass rates. When designing the course for the following year, the other co-supervisor and I deeply examined the reasons for that. We arrived at the conclusion that the cause was not the difficulty of the final exam (it was extremely similar to the exercises solved during the lectures). However, we identified that in the second part of the semester a large number of students stop following the course. After some informal interviews with students and other teachers of the degree, we concluded that students drop out of our course because many students had completely focused on the midterm exams of other courses and, in consequence, lost track for two or three weeks and they could not follow the course anymore. We then decided to change the course's evaluation methodology and mainly focus on continuous assessments of the coursework instead of a final exam. In 2019, the pass rate was increased to 57,5 %, although there is still a lot of work to be done for next year. Despite this higher pass rate, the overall satisfaction of the students with my teaching (item 11 in the evaluation) were quite similar in 2018 and 2019: 4,07/5 and 4,11/5 points, respectively. It seems that the pass rate does not appear to greatly affect students' satisfaction with the course. Student's mini-projects When I started to teach this course, I decided to redesign the mini-project students have to deliver at the end of the semester working in groups of 4-5 students. The main goal of the new mini-project was to analyse a data set with the anonymized grades of students of this same course in previous years using the statistical concepts explained in the lectures. For this purpose, students were asked to use the R programming language. R was chosen because this course is the only opportunity students have to learn this language in their bachelor's degree and the use of this language greatly simplifies the data analysis process. The key application of this project was to build a simple Naïve Bayes classifier to predict, for each student of the course, if they are going to pass or fail. I was very excited with this mini-project. But the reality turned out to be completely different. In 2018, students complained a lot about the use of the R language. They already had two programming courses in the autumn semester but it seems it was not enough to quickly learn the basic use of the R language (although there were notable exceptions), even though I provided them with a lot of support during the supervision. In 2019, I tried to approach this issue by providing code templates where most of the R code were given, so it was relatively easier for them to fill the remaining part needed to complete the task. Five students filled the evaluation survey about mini-projects in 2019 and I got a very bad score (3,02/5) in comparison with the score given to the lectures part of course (4,10/5, which was obtained from 24 students). I have several hypotheses I'm still investigating, but the main one is that these 5 students are not a representative sample. Direct interactions with students and the final scores of 2019 in this part, on average, 6,8/10 points versus 4,8/10 points in the previous year, show me that I'm on the right track, although I still have a lot of work to do. I really have the impression that next year things will be better. In a similar course (Statistics 101 in Environmental Sciences degree), we also employed R language with very-simple-to-fill code templates. Informal and formal feedback seemed to be positive (a 4.58/5 score was obtained, but from only 3 students).

8. Any other information or comments.

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