Ensemble Learning

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Introduction

The study assignment is a transcript analysis of my presentation about "Ensemble Learning". The purpose or aim is firstly to give a brief overview of the technical part of the presentation and secondly to focus on the beginning, the end or another part of the main part of the presentation. The approach is to reflect in writing what was or should be produced in the real-time presentation. In addition the study assignment includes a one page analysis of the transcript in which a detailed breakdown of the presentation language and techniques/elements, which have been used and why they have been used, is given. Last but not least, the study assignment finishes with a conlusion part which can be seen as a phenomenological reflection on the subjective learning experience across all phases and challanges of the presentation process. Furthermore a short introduction to what *Ensemble Learning* is. It is a system of multiple classifiers or also known as "committee-based learning", which trains and combines certain learners and therefore learning algorithms to achieve a higher generalization ability. The three most common and used methods are "Stacking", "Bagging" and "Boosting" (Zhou, 2021) (Zhou, 2012).

Main Transcript

PART I

[…] I'm working on embedded machine learning in a lab on the side and this is exactly the reason why I can tell you something about machine learning and therefore also ensemble learning. First, a few organizational things. The presentation will last approximately 12 minutes and if there are any questions, please take notes and ask your questions at the end of the presentation. To get directly into the topic, there are two cartoons on the next slide.I would like you to look at both of them and then try to explain what ensemble learning can be? […] But before I explain what ensemble learning is, let's have a quick look at the roadmap of the presentation. First, […] summary of what has been said so far, so that the most important points remain in memory […] Okay fine, but what is bootstrap sampling? Its a common method for dividing data into sometimes overlapping subsets.[…] As you can see in the picture on the right, imagine you have one big dataset and three individual learners, then you have to divide the whole dataset into three bootstrapped subsets and train the learners on each of them. The reason for this is that bagging uses homogeneous ensembles, and you cannot train all learners based on the same data, otherwise every algorithm would learn the same things and act in the same way. One applied example is Random Forest, so that's not a forest somewhere in the nowhere but a bagging ensemble of decision trees. […] If you compare this method with the

others and in addition look at the diagram on the right, you will immediately notice that this is a sequential approach. […] Boostings goal is to convert weak learners into strong learners, this is also where the term comes from, because weak learners are boosted. It is an iterative process with training learners and adjustment of training samples. But what is meant by adjustment? So therefore, lets take another look at the diagram. Imagine you have a sample distribution belonging to two classes: blue and orange. Then you want to train your individual learner on this sample distribution. After the training you will get some misclassified samples, but how can you improve your learning algorithm to perform better? This is where sample adjustment comes in. You assign a weight to every sample and each misclassified sample will get a higher weight. In the diagram, this is illustrated by expanding the dot size of one sample. […]

PART II

First of all the presentation starts with introducing myself and giving an overview of the "Presentation Journey"(Williams, 2008). The aim is to show the audience what I am currently working on and what my specialisation is and why I am the right one to tell the audience something about *Ensemble Learning*. ("I' working on embedded machine learning …this is exactly the reson why I can tell you something about …ensemble learning"). This should directly get the attention of the audience and show the audience that I am a professional presenter and that I know what I'm talking about. Further on, I want to attach the attention of the audience once again with a direct question to involve the audience ("…try to explain what ensemble learning can be?"). The background idea is the "BANG"-effect (Bansal, 2012) and with use of cartoons to simply get the audience think about the topic ("…there are to cartoons …"). Moreover I then explained the different methods of *Ensemble Learning*, which are rather theoretical, so with the help of the "VAKOG"-system (Jumbuh Prabowo, 2015) I tried to explain and illustrate the content in a more imaginable and comprehensible way ("As you can see …imagine you have a big dataset …"). In addition the use of rhetorical questions is a key strategy to explain complex technical expressions. The reason for this is to animate the audience to ask the question in their mind to themselves and beyond that they still be curious and attentive ("Okay fine, but what is bootstrap sampling?"). Another thought is that are always provided with bullet points and a lot of information, so a rhetorical question can revive the information. It's always to explain difficult theoretical topics without any visualizations thus I used different diagrams and pictures to illustrate the content ("As you can see in the picture on the right …"). For the explanation and overview of the different methods of *Ensemble learning*, I'm giving an applied example in the real world, so that interested people in the audience can easily remember the

examples and then make further research. Since the information is very tough and rather theoretical, the use of humorous phrases is a key element to keep the adience intent and and prevent them from being overwhelmed or lost in the information ("…Random Forest,so that's not a forest somewhere in the nowhere …"). With another rhetorical question "What is meant by adjustment?", I can moreover explain what is meant by the expression and how it works. Additionally, I tell the audience that we therefore should have another look at the diagram presented in this slide to also have an illustrative way of explanation ("So therefore, lets take another look at the diagram."). Apart from this the *Vakog*-system more specifically the *visual* sense is used to to achieve a better imagination in the minds of the listeners and thus get the gist of the content ("Imagine you have a sample distribution belonging to two classes …"). With regard to this I'm always using "you" to directly address the audience and achieve a higher imagination once again.

Conclusion

In conclusion, the presentation and the course in general have given me a different perspective on the way presentations can be constructed and designed. I have already given so many presentations without directly thinking about the effects of the individual techniques. My main take away is that I can not only convey the information, but I now know to keep the audience tense and awake, how I have to build my structure through the presentation in a meaningful way (e.g. BOMBER B) and how I can easily reflect the difficult-to-unterstand technical aspects through targeted word choice (e.g. VAKOG). Another insight I gained from my presentation is the use of rhetorical questions. One example for this was the question "Okay fine, but what actually is bootstrap sampling?", and with this approach, I could simply illustrate to the audience what exactly is meant by the technical expression. My biggest challenge was the information, which was very theoretical and difficult to unterstand and then how to explain and present it in a simplified and clear way. Presentations that contain a lot of theory are usually boring, that's the reason why I used a "Bang" to involve the audience. The other point for mastering this challenge is the use of the "VAKOG"-System to transform the information in a more illustrative and comprehensible way. Another important point is the use of Sign-Posting. Before the course and the presentation, I always created a presentation with different parts and sections without being aware that there is such a technique like Sign-Posting and what it's used for. Signposting creates "verbal paragraphs" or "verbal singals" to raise the attention curve at the beginning and eand of each point of your presentation. Therefore it is technique to help you to structure and sahpe the main content of your presentation (Williams, 2008). All in all,

I can now not only give an informative presentation, but I am also aware of what I am doing or acting on and I now know the resulting effect of it.

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