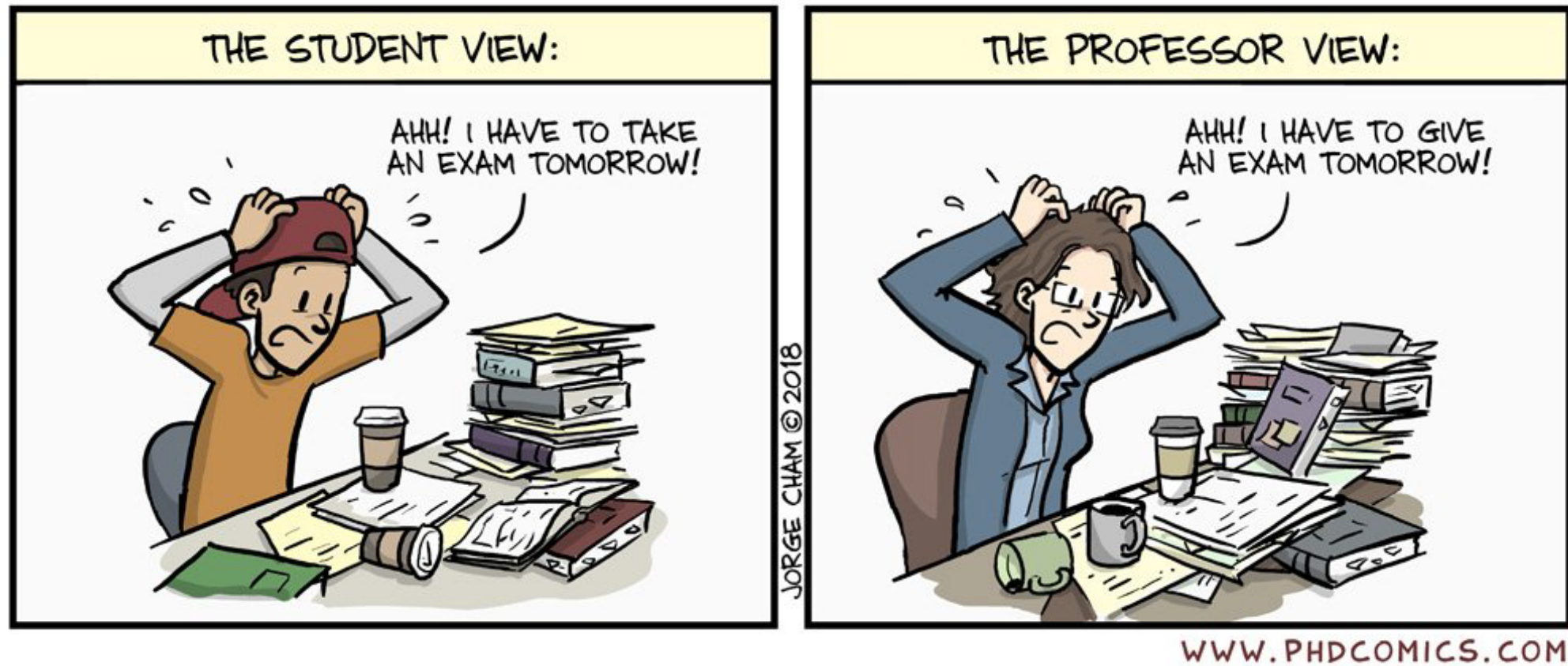


14– exam preparation



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Disclaimer: Besides the exhausting exam period, please don't forget that the federal election is coming up soon. Participation will be rewarded with karma points. Karma points increase linearly by a factor of 1 for every motivated fellow citizen (friends, family, ...). Thank you for your participation.

What are the advantages of using AI in forest inventory?

Describe briefly what the German Federal Forest Inventory might look like in 2050 (max 6 sentences).

A KI model for recognizing individual trees is given, which was trained with data from France, Germany, and Switzerland. Provide an assessment of whether this model can now be applied in Slovenia and what should be considered in this context.

Outline how you transition from a point cloud to a normalized Digital Surface Model. Why could this model be interesting in the context of forest inventory?

Would you provide continuous environmental dynamics as spatial data in vector or raster format (brief justification)

A drone-based point cloud of a topographically variable forest area is provided. Sketch a workflow diagram showing how to derive stem positions (X, Y) and crown tips (X, Y, Z) at the individual tree level from this point cloud.

You are training a machine learning model with a massive dataset. You realize that the training exceeds your available computational resources. What can you do to train the model in less time?

Outline an approach to predict mortality risks or tree species suitability for future decades (e.g., for the year 2100).

Provide three examples of how machine learning or artificial intelligence can be applied in the context of forestry and geodata. Provide three examples (max. 2 sentences per example).

How can sampling errors be minimized? Provide 2 examples.

What is usually understood by segmentation in remote sensing? Provide two forestry-related examples and describe the application as well as the sensor and data type.

You have a point cloud for an area from a terrestrial and a drone-based laser scan. Which method would you prefer for measuring the diameter at breast height and which for tree height? Justify your answer.

AI is extremely promising in the field of forestry. To what extent does the often very conservative attitude in forestry slow down the development of AI methods?

From what DBH value is a tree considered as such in a forestry inventory?

Would you provide inventory results as a spatial dataset in vector or raster format (brief justification)?

Conventional terrestrial inventory methods, such as those of the National Forest Inventory, are clearly no longer up-to-date in terms of efficiency and accuracy. Why should they still be continued in certain cases in the medium term?

What sensors are used on drones? Provide 3 examples.

Name and briefly describe possible sources of error in a terrestrial inventory.

You have received data along with an EPSG code from a collaboration partner and want to merge it with your data. Why might the EPSG code be useful?

What does RTK have to do with the mobile network?

You want to approximate the carbon storage of a forest, but you only have a vertex and a measuring tape available. How do you proceed?

Which forestry-relevant metric can be determined using the Vertex Hypsometer, and what is the approximate error range?

What is the goal of the international cooperation program ICP Forests, and how is it implemented?

What is meant by Dilution of Precision (DOP), and how do the different DOP values (e.g., HDOP, VDOP, PDOP) affect the accuracy of GNSS positioning?

Why might extrapolations of ICP Forest not be representative, and which remote sensing platform could geographically provide representative data collection?

Estimate the expected GNSS accuracy in a dense forest without corrections. Which factors (name at least 3) influence the accuracy?

Name 4 parameters that can be recorded/determined before the start of the National Forest Inventory and 4 parameters that are determined during the survey of the National Forest Inventory.

Explain how the Global Navigation Satellite System (GNSS) works and what role the signal travel time plays in position determination.