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? Error on my first submission: unable to open file 'Sigma-1-3.csv' although my code generates one 1 new 9 ▾

On my first submission I got the following error: unable to open file 'Sigma-1-3.csv' altho...

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💬 Variational Inference for LDA based Topic Modeling 1 ▾

Dear Professor, It has been an excellent learning experience in this course, thank you ver...

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💬 Failed to Submit Project 3 2 ▾

I got failed submission of the project 3 because of running out time and being killed. The...

💬 Test your program 7 ▾

I was wondering if the training and testing data developed by teh_failerer for the Week 6 ...

💬 Learning and the Relationship between Bayes Linear Classifier & Gaussian Mixture Model 5 ▾

I spent an hour this morning summarising, on a single page, Bayes Linear Classifiers and ...

? [Can a centroid fail to have any data points assigned to it in k-means?](#) 14 ▾

💬 [Project 3: Problem with assumption that Sigma is the Identity Matrix](#) 2 ▾

In project 3, for the EMGMM algorithmn, there is an assumption that the covariates matr...

☑ something wrong on vocareum Week 9 Project: Clustering 7 ▾

To whom it may concern, I've accessed to vocareum Week 9 Project: Clustering. But scree...

☑ [\[STAFF\] what are suggestions for UCI datasets?](#) 2 ▾

Dear Staff, As in the previous projects, the course designers write: > "We strongly sugges...

☑ [\[STAFF\] Please Fix Access to Week 9 Project.](#) 5 ▾

Access to the week 9 project on vocareum is not working. Please fix it. Thanks.

💬 [Very little activity in discussions...](#)

Learning and the Relationship between Bayes Linear



Classifier & Gaussian Mixture Model



discussion posted about 23 hours ago by [Parnell](#)

I spent an hour this morning summarising, on a single page, Bayes Linear Classifiers and Gaussian Mixture Models, and things have become much clearer. From a learning perspective, it took me from understanding the material to knowing the material.

related to: [Week 9 / Lecture](#)

this post is visible only to Default Group.

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2 responses

[wvdzwart](#)

about 21 hours ago



Can you share the summary, perhaps include a scan of it?

For me the whole probabilistic models are not that clear yet. Or are you saying that you learned the most from constructing the summary, and others won't learn that much by just reading your summary?

My intention was to advise peers of the value of summarising salient material.



posted about 16 hours ago by [Parnell](#)

Thanks. A colleague of mine at work is doing a completely other course, and he mentioned that he was creating mind-maps of the material he had to learn. This to somehow relate the numerous small facts into a greater whole. The practice of creating the mind-maps already helped him with his study, and the resulting mind-maps themselves were like small intuitive summaries of the materials where you can quickly see the relationships between different subjects.



I immediately thought this seemed like a good idea to apply on the AI and ML course material as I expect it would be easier to learn for the final exams than just the countless pages of handouts (which are kind of linear in structure). But so far I have not found the time to actually create any mind-maps. I am constantly trying to keep up with the two courses. Just last Sunday evening I completed week 8, and were completely in schedule for the first time since the start of the two courses.

posted about 13 hours ago by [wvdzwart](#)

Add a comment

Support

Parnell

about 16 hours ago

AMES CLASSIFIED # Assignment 2

$X = \mathbb{R}^d$ and $Y = \{1, \dots, K\}$

• Class Priors: MLE estimate of π_y is $\hat{\pi}_y = \frac{1}{n} \sum_{i=1}^n \mathbb{1}(y_i = y)$

• Class Conditional Density: Choose $p(x|y=y) = N(x|\mu_y, \Sigma_y)$

The MLE estimate of (μ_y, Σ_y) is

$$\hat{\mu}_y = \frac{1}{n_y} \sum_{i=1}^n \mathbb{1}(y_i = y) x_i$$

$$\hat{\Sigma}_y = \frac{1}{n_y} \sum_{i=1}^n \mathbb{1}(y_i = y) (x_i - \hat{\mu}_y)(x_i - \hat{\mu}_y)^T$$

Plug-in Classifier: $\hat{f}(x) = \arg \max_{y \in Y} \hat{\pi}_y |\hat{\Sigma}_y|^{-\frac{1}{2}} \exp \left\{ -\frac{1}{2} (x - \hat{\mu}_y)^T \hat{\Sigma}_y^{-1} (x - \hat{\mu}_y) \right\}$

• GMM lets us fit like a k-class Bayes classifier, where the label of x_i is $\hat{\text{label}}(x_i) = \arg \max_k \pi_k N(x_i | \mu_k, \Sigma_k)$

• For GMM, since $\phi_i(k)$ is changing we have to update n_k values. With Bayes classifier, " ϕ_i " provides the label, so it was known

GMM Max. Likelihood EM for MM.

Assignment 3

Given: Data x_1, \dots, x_n where $x \in X$

Goal: Maximise $h = \sum_{i=1}^n \ln p(x_i | \pi, \theta)$

where $p(x|\theta_k)$ is problem specific.

• Iterate until incremental improvement to h is small.

① E-step: for $i=1, \dots, n$ set # data points

$$\phi_i(k) = \frac{\pi_k p(x_i | \theta_k)}{\sum_j \pi_j p(x_i | \theta_j)}$$

for $k=1, \dots, K$

clusters

② M-step: for $k=1, \dots, K$ define $n_k = \sum_{i=1}^n \phi_i(k)$

$$\pi_k = \frac{n_k}{n}, \quad \theta_k = \arg \max_{\theta} \sum_{i=1}^n \phi_i(k) \ln p(x_i | \theta)$$

$$\mu_k = \frac{1}{n_k} \sum_{i=1}^n \phi_i(k) x_i, \quad \Sigma_k = \frac{1}{n_k} \sum_{i=1}^n \phi_i(k) (x_i - \mu_k)(x_i - \mu_k)^T$$

Almost identical

Updated / unknown

known

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