一份简短的 Beamer 模板 – 深色主题 (Darkblue)

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Outline

What's this Beamer about?

- Specific statistical methods for many research problems
- Github hyperlinks: click here:Beamer-of-XMU-WISERCLUB & WISE
  - How to learn (or create) new methods
  - Inference: Using facts you know to learn about facts you don't know
- If you want to learn more details about LaTeX, you can click How to install and use LaTeX
- My WeChat GongZhongHao Have you realized how to build a personal blog site?

What's this course about?

- Specific statistical methods for many research problems
- Hyperlinks (click here)
  - How to learn (or create) new methods
  - Inference: Using facts you know to learn about facts you don't know
- How to write a publishable scholarly paper
- All the practical tools of research — theory, applications, simulation, programming, word processing, plumbing, whatever is useful
- $\rightsquigarrow$ Outline and class materials:

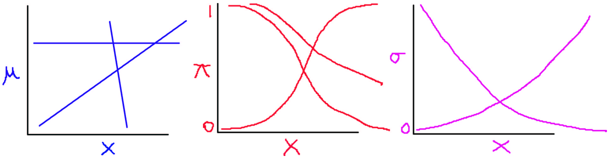
j.mp/G2001

  - The syllabus gives topics, not a weekly plan.
  - We will go as fast as possible subject to everyone following along
  - We cover different amounts of material each week

Alerts

- First level alert
- Second level alert
- Third level alert
- Fourth level alert
- Fifth level alert

Systematic Components: Examples



- $E(Y_i) \equiv \mu_i = X_i\beta = \beta_0 + \beta_1 X_{1i} + \cdots + \beta_k X_{ki}$
- $\Pr(Y_i = 1) \equiv \pi_i = \frac{1}{1+e^{-x_i\beta}}$
- $V(Y_i) \equiv \sigma_i^2 = e^{x_i\beta}$
- Interpretation:
  - Each is a class of functional forms
  - Set β and it picks out one member of the class
  - β in each is an "effect parameter" vector, with different meaning

Negative Binomial Derivation

Recall:

one two three

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$$\Pr(A|B) = \frac{\Pr(AB)}{\Pr(B)} \implies \Pr(AB) = \Pr(A|B)\Pr(B)$$

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$$\mathrm{NegBin}(y|\phi,\sigma^2) = \int_0^\infty \mathrm{Poisson}(y|\lambda) \times \mathrm{gamma}(\lambda|\phi,\sigma^2)d\lambda$$

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$$\begin{aligned}\text{NegBin}(y|\phi,\sigma^2) &= \int_0^\infty \text{Poisson}(y|\lambda) \times \text{gamma}(\lambda|\phi,\sigma^2)d\lambda \\ &= \int_0^\infty \P(y,\lambda|\phi,\sigma^2)d\lambda\end{aligned}$$

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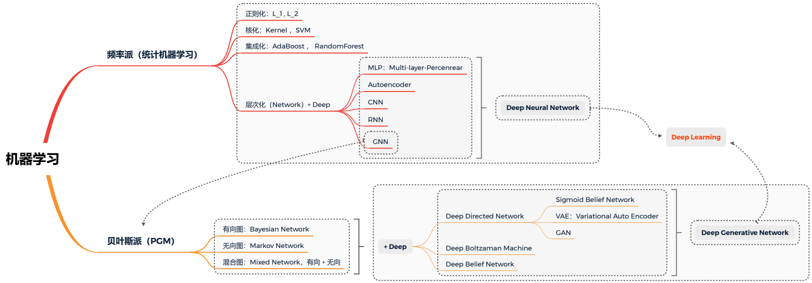
$$\begin{aligned}
\text{NegBin}(y|\phi,\sigma^2) &= \int_0^\infty \text{Poisson}(y|\lambda) \times \text{gamma}(\lambda|\phi,\sigma^2)d\lambda \\
&= \int_0^\infty \P(y,\lambda|\phi,\sigma^2)d\lambda \\
&= \frac{\Gamma\left(\frac{\phi}{\sigma^2-1}+y_i\right)}{y_i!\Gamma\left(\frac{\phi}{\sigma^2-1}\right)}\left(\frac{\sigma^2-1}{\sigma^2}\right)^{y_i}\left(\sigma^2\right)^{\frac{-\phi}{\sigma^2-1}}
\end{aligned}$$

2 columns

- SVM
- GMM
- EM



数据与 tabular 环境

Category of your contents	Different types of each Category	other type of your data
	Different types of each Category	other type of your data
	....	....
	θ^{-1}kg	
Type of date (numbers)	0.0056 $\pm$ 0.0097, 0.0021 $\pm$ 4.0056	3.5 $\times$ 10^5 ; 5.43 (9.30%)
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Mathematical formulas	$\frac{\mu^2}{\pi-2\theta} \times \sqrt[3]{\Vert\nu_i-\hat{\phi}\Vert} + \lim\limits_{s\to\infty} \int_0^{+\infty} f(x)e^{xsi}\mathrm{d}x$	$f(x) \in C^1[0,+\infty], \Vert f(x^n)\Vert_2 \leqslant \lambda$
	$\frac{\mu^2}{\pi-2\theta} \times \sqrt[3]{\Vert\nu_i-\hat{\phi}\Vert} + \lim\limits_{s\to\infty} \int_0^{+\infty} f(x)e^{xsi}\mathrm{d}x$	$f(x) \in C^1[0,+\infty], \Vert f(x^n)\Vert_2 \leqslant \lambda$
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Language description	This is the element described in your language	Mathematical language description
	This is the element described in your language	Mathematical language description
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	This is the element described in your language	Mathematical language description
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Projection data	3.5 $\times$ 10^5 This is the element described in your language	0.0056 $\pm$ 0.0097, 0.0021 $\pm$ 4.0056
	3.5 $\times$ 10^5 This is the element described in your language	0.0056 $\pm$ 0.0097, 0.0021 $\pm$ 4.0056
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tabel 1: *Contents of different types of tables.*

Word2Vec

topic 1			topic 2			topic 3			topic 4		
1	科技	0.9995	2	板块	mm	3	科技	mm	4	3500	mm
1	板块	0.9994	2	锂电池	mm	3	新能源	mm	4	反弹	mm
1	调整	0.9994	2	a 股	mm	3	in	机构	4	指数	
1	资金	0.9994	2	芯片	mm	3	in	板块	4	清仓	
1	业绩	0.9994	2	散户	mm	3	in	半导体	4	券商	mm
1	公司	0.9994	2	震荡	mm	3	in	中国	4	科技	mm
1	股价	0.9994	2	早盘	mm	3	in	芯片	4	in	mm
1	股市	0.9994	2	inches	mm	3	in	mm	4	in	mm
1	大跌	0.9994	2	inches	mm	3	in	mm	4	in	mm
1	基金	0.9994	2	inches	mm	3	in	mm	4	in	mm

tabel 2: *Word2Vec of texts*

Structural Features

Levels of Structure

- usual LaTeX \section, \subsection commands
- ‘frame’ environments provide slides
- ‘block’ environments divide slides into logical sections
- ‘columns’ environments divide slides vertically (example later)
- overlays (à la prosper) change content of slides dynamically

例 (Overlay Alerts)

On the first overlay, this text is highlighted (or *alerted*).
On the second, this text is.

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Algoritmos 代码 1

Algorithm 1: Algorithm Example

input : x: float, y: float
output: r: float

```
while True do
    r = x + y;
    if r >= 30 then
        "O valor de r é maior ou iqual a 10.";
        break;
    else
        "O valor de r = ", r;
    end
end
```

Reviewing DeepWalk algorithm

Algorithm 2: Reviewing random walk + skip gram

for $n = 1 , 2 ,..., N$ **do**

Pick w_1^n according to a probability distribution $P(w_1)$. Generate a vertex sequence $(w_1^n, \cdots, w_L^n)$ of length L by a random walk on network G ;

for $j = 1 , 2 ,..., L\text{-}T$ **do**

for $r = 1 , 2 ,..., T$ **do**

Add vertex-context pair $\left(w_j^n, w_{j+r}^n\right)$ to multiset $\mathcal{D}$;

Add vertex-context pair $\left(w_{j+r}^n, w_j^n\right)$ to multiset $\mathcal{D}$

Run SGNS on $\mathcal{D}$ with b negative samplpes.

Code blocks

```python
# Say hello in Python
def hello(name):
return("Hello" + " " + name)

```

Code blocks

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def hello(name):
return("Hello" + " " + name)

```

```c
/* Say hello in C */
#include <stdio.h>
int main()
{
  char name[256];
  fgets(name, sizeof(name), stdin);
  printf("Hello %s", name);
  return(0);
}

```

Theorems and Proofs

The proof uses *reductio ad absurdum*.

定理

There is no largest prime number.

证明.

1. Suppose p were the largest prime number.

4. But $q+1$ is greater than 1, thus divisible by some prime number not in the first p numbers. □

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定理

There is no largest prime number.

证明.

1. Suppose p were the largest prime number.
2. Let q be the product of the first p numbers.
3. Then $q+1$ is not divisible by any of them.
4. But $q+1$ is greater than 1, thus divisible by some prime number not in the first p numbers. □

Blocks

Normal block

A set consists of elements.

Alert block

$2 = 2.$

Example block

The set $\{1, 2, 3, 5\}$ has four elements.

Data

Methodology and Variables

Regression Results

Details

Example:Mnist

```python
### Using the SkLearn interface ###
from keras.datasets import mnist
from catboost import CatBoostClassifier,Pool
from sklearn.model_selection import GridSearchCV
from sklearn.metrics import accuracy_score
import numpy as np
(X,y),(X_test,y_test) = mnist.load_data()
# (60000,28,28)
print('x_shape:',X.shape)
# 60000
print('y_shape:',y.shape)
X = X.reshape(X.shape[0],-1)/255
X_test = X_test.reshape(X_test.shape[0],-1)/255

param_test = {'iterations':np.arange(10,51,20),'learning_rate':[0.1,0.2],
        'depth':np.arange(4,9,2)}

cat = CatBoostClassifier(eval_metric="AUC",one_hot_max_size=31,l2_leaf_reg= 9,silent=False)
grid_search = GridSearchCV(estimator=cat,param_grid=param_test,cv=2,verbose=2,n_jobs=-1)
grid_search.fit(X,y)
# grid_search.cv_results_  # Search for detailed results
grid_search.best_params_
grid_search.best_score_
cat = grid_search.best_estimator_  # Best model
y_pred = cat.predict(X_test)
accuracy = accuracy_score(y_pred,y_test)
print("The test set accuracy rate is:%.2f%%"%(accuracy*100.0))
```

参考文献 I

Hosono K and Miyakawa D and Uchino T, et al.
Natural disasters damage to banks and firm investment, 2016.
https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.592.8648&rep=rep1&type=pdf

Thanks!