

炼丹学导论

Vincent

Outline

我是谁?

啥是炼丹?

我的summer research timeline

自问自答

一些建议

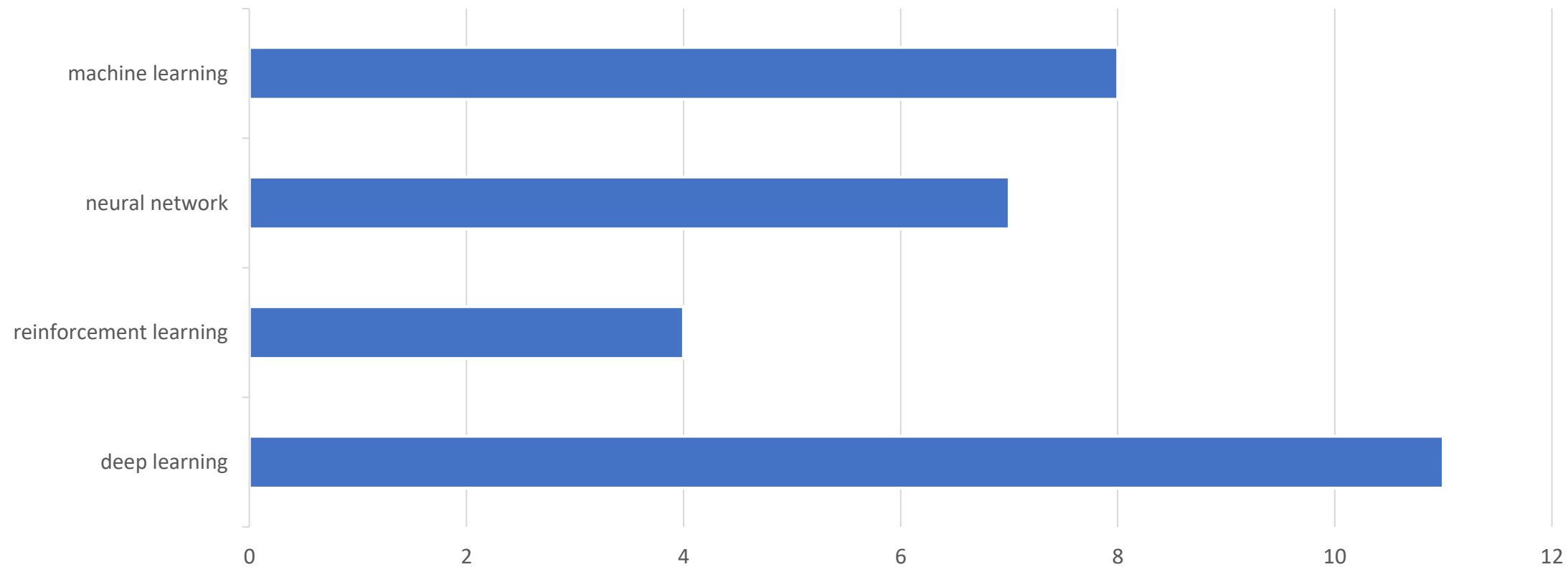
感想（吐槽）时间!

Q&A

Vincent是谁？

- 陈思锦 Vincent/Sijin, year 2, CS, S.H.Ho College
- 去年做了菲老师的3d detection （今年的project 8）
- Wu Zheng, Weiliang Tang, Sijin Chen, Li Jiang, and Chi-Wing Fu, *CIA-SSD: Confident IoU-Aware Single-Stage Object Detector from Point Cloud*, Association for the Advancement of Artificial Intelligence (AAAI), 2021. <https://arxiv.org/abs/2012.03015>
- <https://github.com/Vegeta2020/CIA-SSD>
- Best Project Award
- 现在已经溜了，想往理论方向发展

appearance of "learning"



炼丹? ? ?

- Applied machine learning
- Computer Vision
 - image classification
 - object detection
- Natural Language Processing
 - machine translation
 - voice recognition
- Learning x
- Reinforcement learning

90年代的媒體：
人工智能會在十年內毀掉社會

現在的人工智能：



炼丹? ? ?

- Applied machine learning
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 - image classification
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- Learning x
- Reinforcement learning



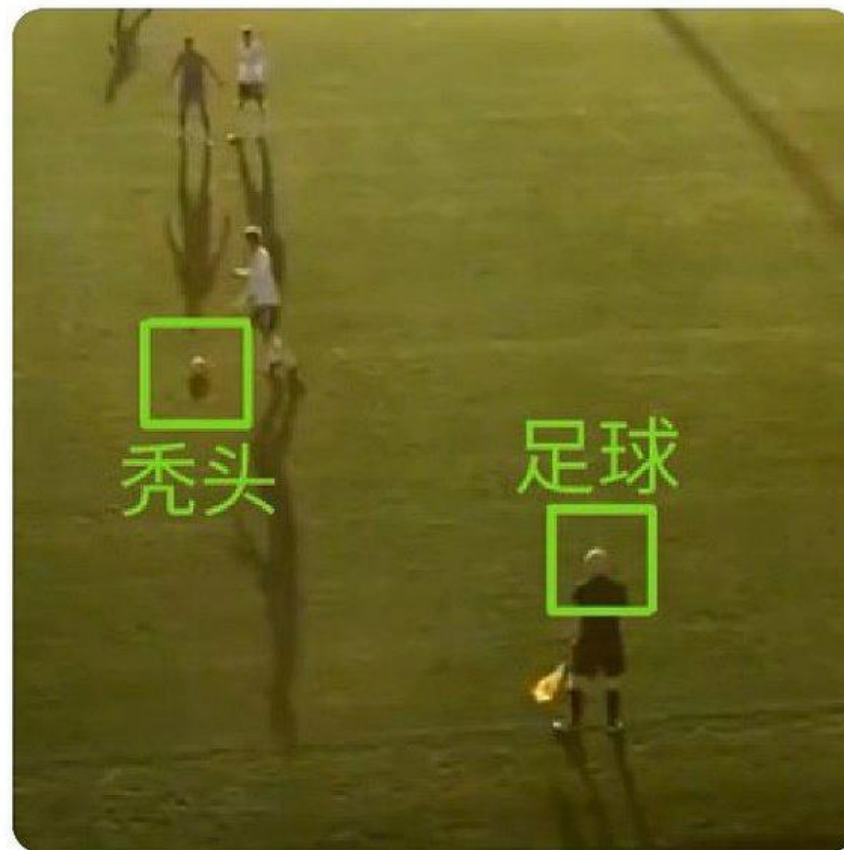
❄️ 🌸 奏雪 🌟 🌌

@Kanayuki_Chan

Replying to @ruanyf and @AnOrdinarySlime

当大家都在担心人工智能将要统治世界的时候，人工智能：↓↓↓

[Translate Tweet](#)



3d object detection

input

data augmentation

voxelization

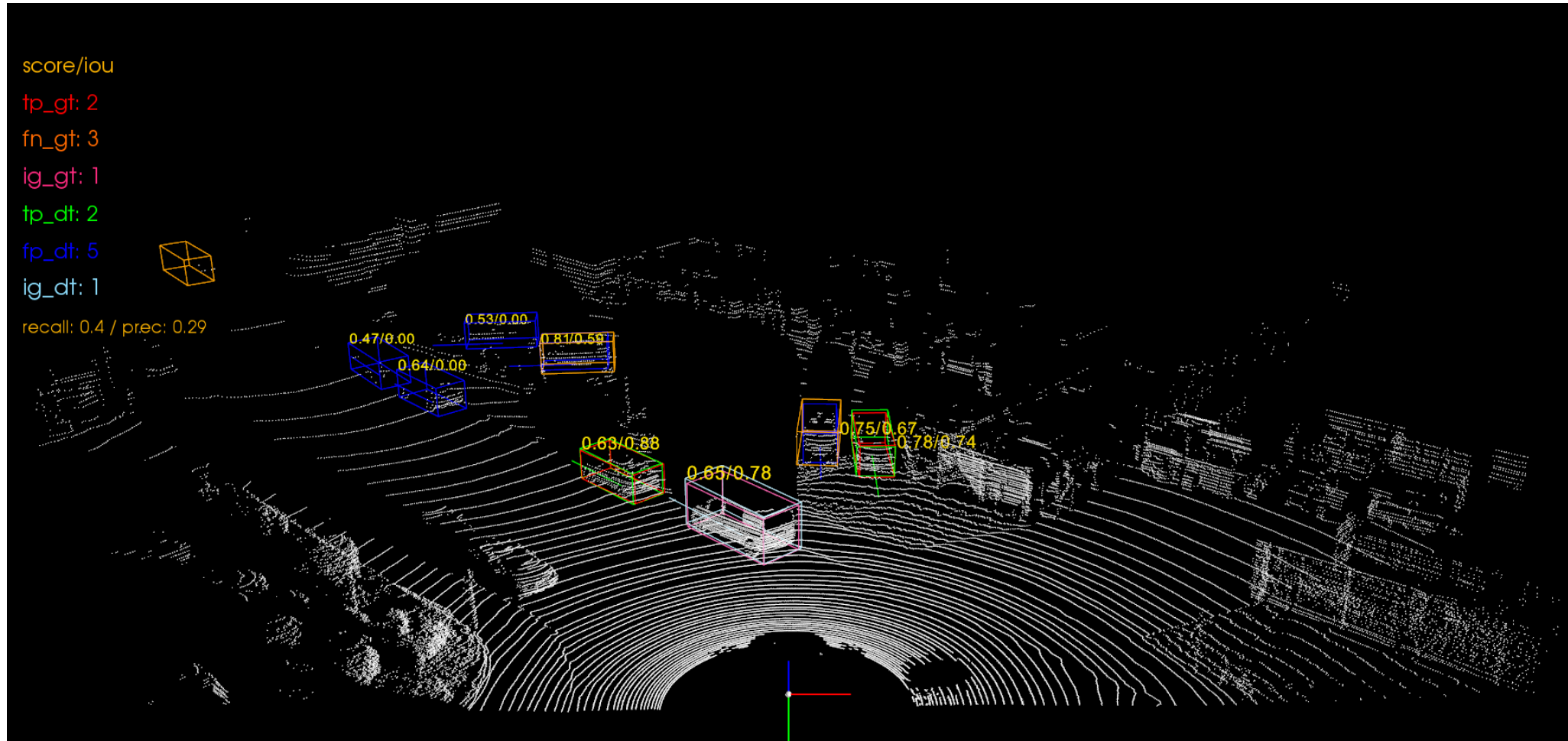
network

output

Given:
LiDAR-generated
point cloud data



Task:
localize all the
cars by rendering
respective
bounding boxes



3d object detection: baseline model

input

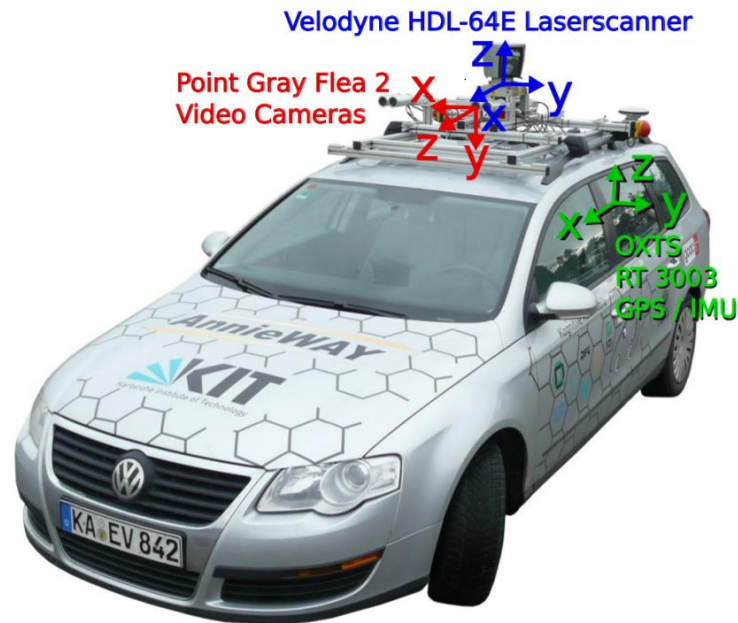
data augmentation

voxelization

network

output

$$\begin{pmatrix} x_1 & y_1 & z_1 & r_1 \\ x_2 & y_2 & z_2 & r_2 \\ \dots & \dots & \dots & \dots \\ x_M & y_M & z_M & r_M \end{pmatrix}$$



no dataset enumerates all the possible situations
alleviate overfitting

- ground truth augmentation (GT-AUG)
- per-object augmentation
 - scaling
 - rotation
 - translation
- global augmentation
 - scaling
 - rotation
 - flipping

3d object detection: baseline model

input

data augmentation

voxelization

network

output

grids in 3d-space resembling pixels in 2d space

convert **irregular** raw data to **uniformly shaped** tensor (1408 * 1600 * 40 * 4)

visualization

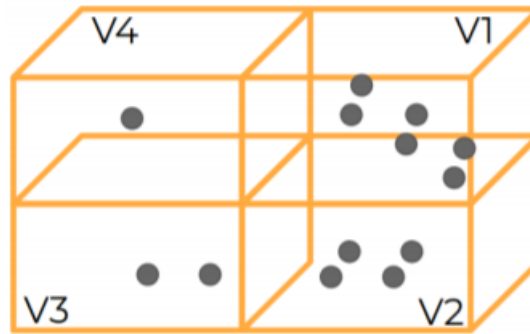
irregularly scattered
input points



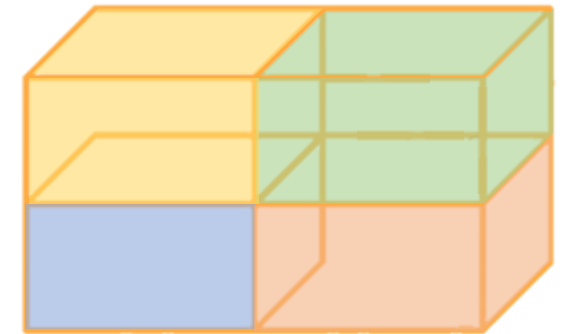
mathematical
interpretation

matrix $\mathcal{P} \in \mathbb{R}^{13 \times 4}$

voxel partition

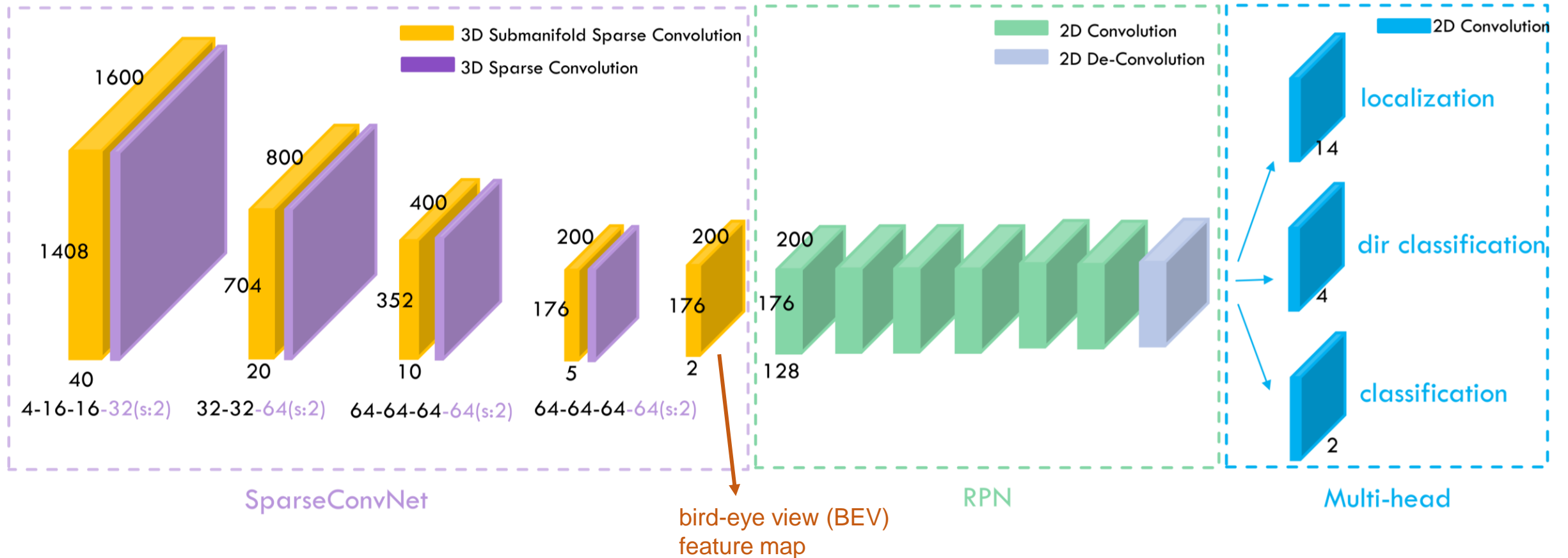


uniformly shaped

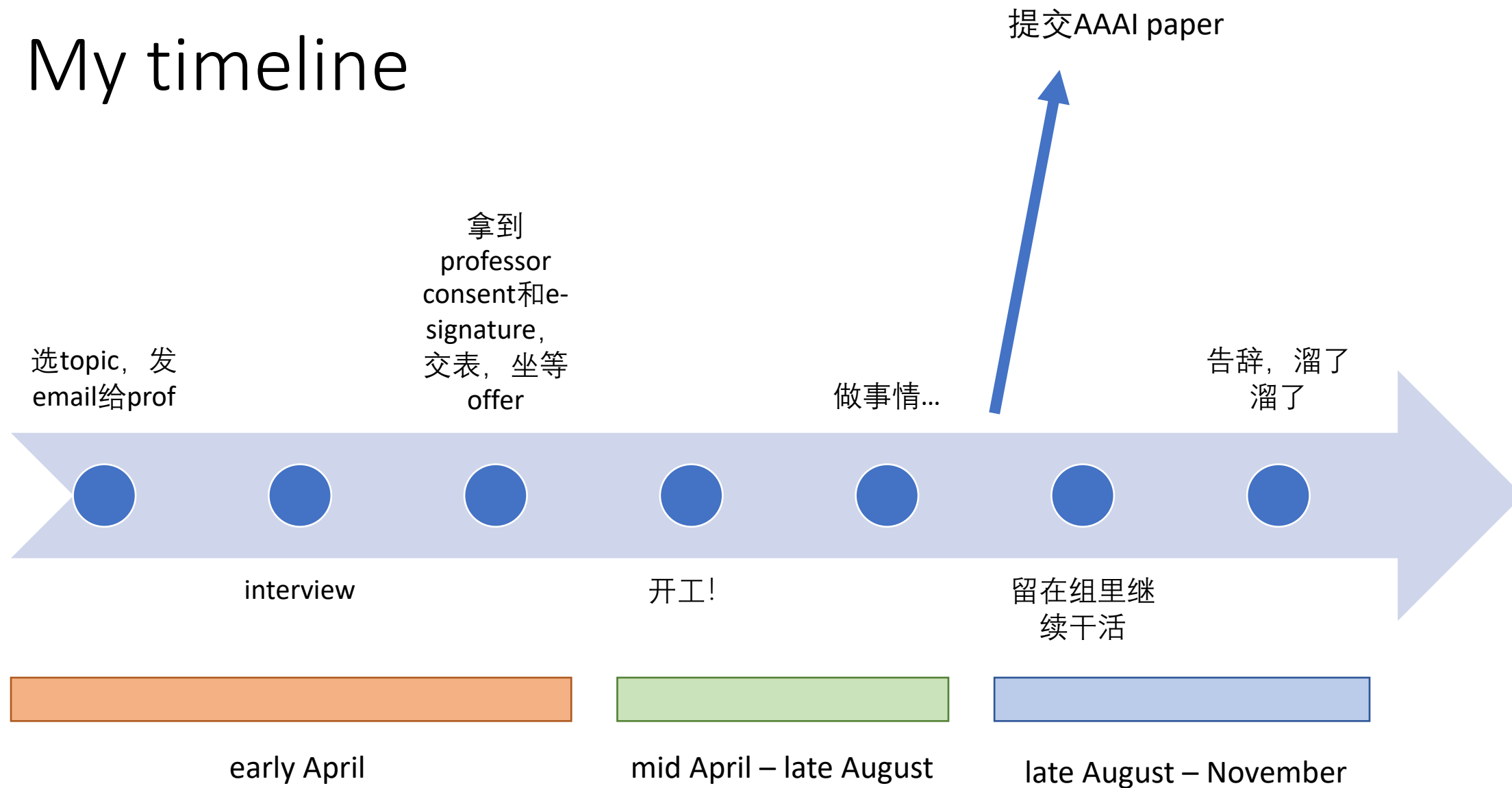


tensor $\mathcal{V} \in \mathbb{R}^{2 \times 2 \times 1 \times 4}$

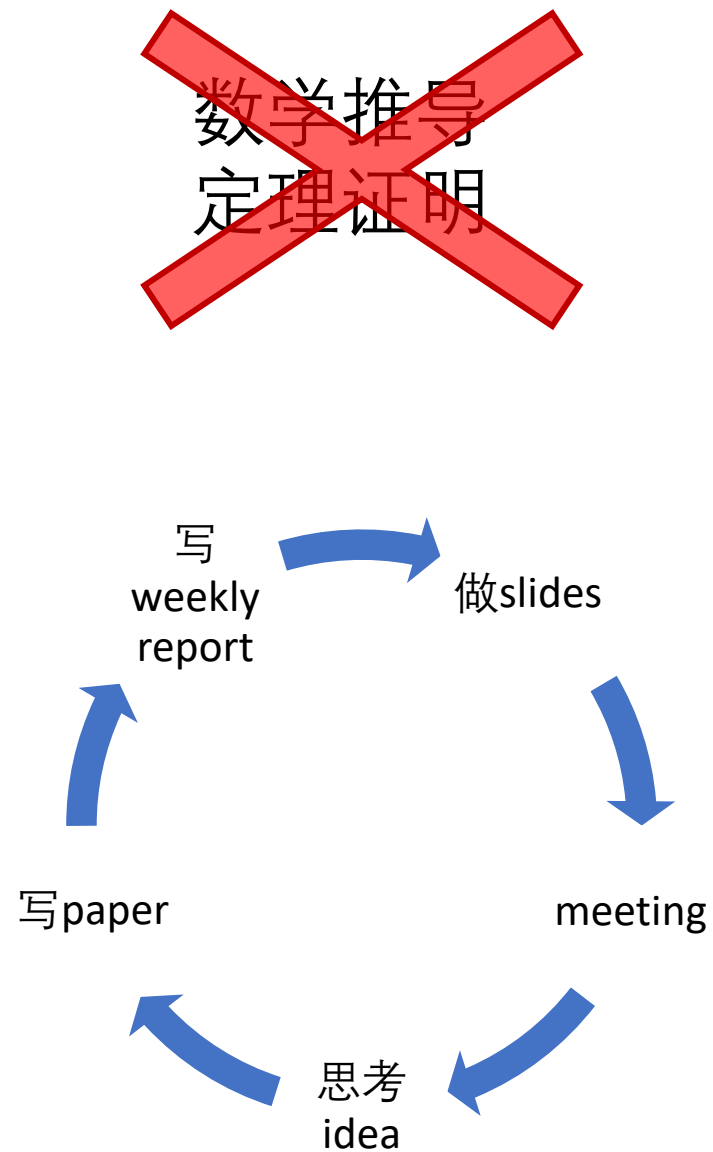
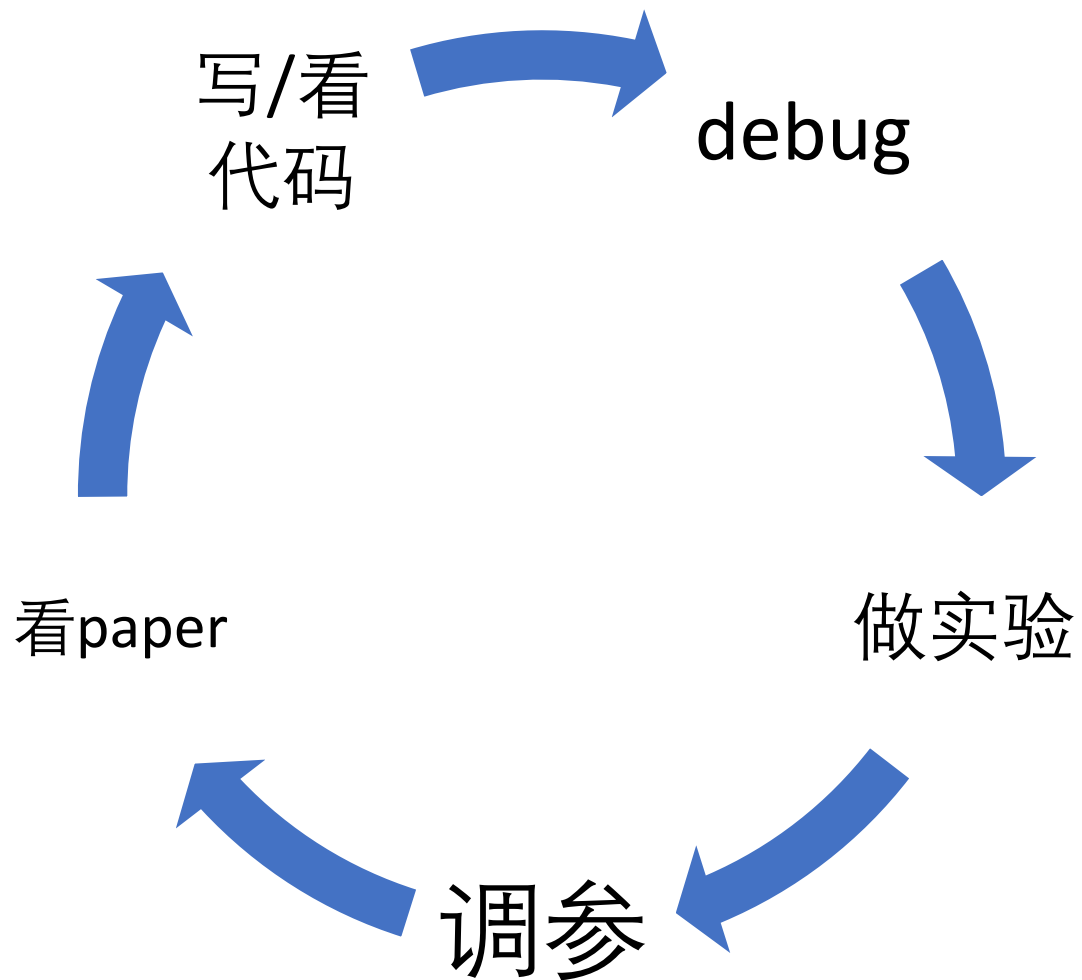
3d object detection: baseline model



My timeline



炼丹的日常



这么高?

那有pa_aug的呢?

Em..没有用过pa_aug

那我跑个pa aug的

不过现在没卡

在跑两个sessd lr配置的ped

linux9在跑一个giou的ped

giou不会报错?

nan解决了?

我用了改后把nan转成0的optimizer

暂时跑着先

这样做之前是导致loss不断增大了

后来放弃了

我待会看看结果

可以 $(1.5 * iou_loss + 0.5 * loc_loss) * 0.5$

你都试试吧, 别把卡浪费了

嗯嗯

这么多卡还是需要点结论的

嗯嗯

我看你的曲线是24的时候下降

可能是学习率下降导致的

是不是学习率下降太快了

对欸

前面的学习率下, 模型学习是否充分? 是否过早的调试了学习率?

那我先保持0.003, 等它要下降了再调

嗯, 这样你可以resume, 不用训很多模型

自问自答

- 我是 year1/我没有科研经验，能不能做 sr?
- 万一没出成果咋办?
- 我没学过 python, linux, 能不能报炼丹 (大多要求 python 和 linux) ?
- 我没学过高深的数学 (指超出多元微积分和线代), 能不能报炼丹?
- 我不知道什么是神经网络, 能不能报炼丹?
- 炼丹强调什么能力?
- approach prof 的时候要不要写 proposal?
- 万一申了个 project, 做了之后才发现不喜欢咋办?

如果您想试试炼丹，建议

• 赶紧学



LATEX

- 赶紧了解什么是deep learning (CS231n, CSCI3320, Youtube)
- 如果一切谈妥，赶紧进组做事 (别等到7.1正式开始才去)

感想 (吐槽) 时间

404

Not Found

The resource requested could not be found on this server!