

Subject: ??????

Topic: AlphaGo - ?????????? Zero????

AlphaGo - é»fâ£«â, 'éi-â'ia...-é-(æ¼"è-) Zeroæœ²é"æ¥µé™•

ã½œè€...: play

Date: 2017â¹¹11æœ¹10æ—¥ 16:45:50

ä¼†è‡i¼š: http://www.pgs2.net/modules/newbb/viewtopic.php?post_id=4832

2017?11?10?16:30 ????? ?? | [??10](#)



?????11?10????????????

???DeepTech???Â ???Â ???



Google DeepMind??????????AI?????À Oriol Vinyals??EmTech
China?????????2018?1?28-30????????? 2016 ??Google ?? DeepMind ????? AlphaGo
?????????????????? 5 ??AlphaGo ?????????????????????????????????????DeepMind ??? AlphaGo
Zero??????????????????
?? AlphaGo?
???Google ??????????????
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DeepMind ????????????????????? AlphaGo ??? 11 ?
10 ???AlphaGoâ€”â€”” ??
DeepMind ?????Mastering the game of Go without human knowledge???????????????????? Facebook ???
AlphaGo Zero ????????????? AlphaGo ????????????? AlphaGo Zero ???â€”â€””AlphaGo ??????
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?? 2045 ????????????? 100
??? ? DeepMind ????????????????????? AlphaGo
Zero??



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? ??? DeepMind ????? AlphaGo
?? Demis Hassabis?DeepMind ? CEO?????????????
???AlphaGo ???
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????? Erica ? 2010 ?????????? 19 ?????????????? 8 cores?Zen ?? 6 ? PC???? Many
Faces of GO ?? 12 cores????????????????????????????????????Demis Hassabis
?? DeepMind???????? GO Project
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結論

- AlphaGo的成功是深度學習與強化學習
- AlphaGo專案起始至收尾，團結力量大
- 硬體資源與TPU扮演重要角色
- AlphaGo Zero展示了強化學習的巨大
- A.I.在可見的未來將成為人類的工具，

AlphaGo ?????????????????David Silver ???
70~80%?????? David Silver ??? over fitting
?????AlphaGo ?????????? 95%????????? AlphaGo Zero ????????

AlphaGo的最 判斷形勢的價值網路

- David Silver的創見，Arthur Guez
- 強化學習結合深度學習(神經網路)
- 左右互搏的自我學習
- 克服overfitting

開路先鋒總是辛苦的.....

??
?? DeepMind ??????
?? Google ???????????????????
GPU ? TPU ?????????? TPU ?????????????????????? ??????????????AlphaGo
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????????????????? AI ?????????????? AlphaGo Master?

AlphaGo Master

- 解決"弱點"
- Dual Network (20-block ResNet)
- 改進training pipeline, MCTS
- 模仿棋、循環劫
- 讓AlphaGo Lee 三子(不貼目)

?? 1? ??? AlphaGo ?????????????????????? 13 ???
40 ?????? ResNet? 2? ? 2 ?????????????????????? 1 ?????? AlphaGo ?????????????????????????????? 3? ??????
pipeline? 4? ?????????????????????

測試地點



A photograph of a meal on a table. In the foreground is a white bowl filled with ramen, topped with yellow chashu and green garnishes, with chopsticks resting on it. Behind the bowl is a red Asahi beer bottle. To the right, a portion of a laptop is visible. The background shows some greenery and a window.

? | AlphaGo Master ????? 60 ???AlphaGo
????????????????? ?????? **AlphaGo Zero** AlphaGo Zero ??????????????????
?? 19X19 ?????? ??????
AlphaGo ????????????????????????????????????? AlphaGo Zero ??????? AlphaGo
Master?? AlphaGo Master ??????????????3
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AlphaGo Zero ?? 2000 ? TPU ????? 40 ??? 40
??AlphaGo Zero
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?????? **AI** ??? **AI** ??? Far
Away?? **David Silver** ??????AlphaGo
?? **DeepMind**
?? **DeepMind** ??????? ????????? AlphaGo Zero
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AlphaGo Zero的突破 - 強

- 大量測試AlphaGo Master, 準備與柯潔九
- RL training pipeline效能極大化 - continu
- 移除rollouts, handcrafted features

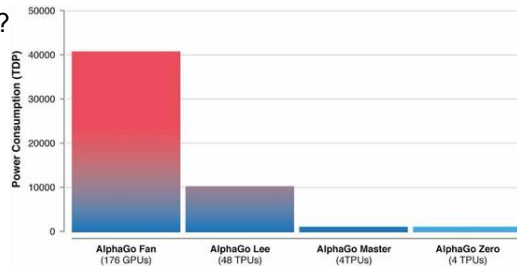
1. AlphaGo Zero 1? AlphaGo Zero
 2? 36 AlphaGo Zero AlphaGo
 v18 AlphaGo Lee 3? 3 AlphaGo Zero ?? AlphaGo v18 ?? 100% ??? 4? ???
 AlphaGo Zero ??? Master ??? Master ??? 60 ??? AlphaGo ??? 5? 40 ??? AlphaGo Zero ??
 Master ??? 90% AlphaGo



DeepMind AlphaGo 20~30
 AlphaGo Deep Learning Reinforcement learning Tree Search

Elo ratings AlphaGo Policy Network Value Network

AlphaGo Fan (176 GPUs) AlphaGo Lee (48 TPUs) AlphaGo Master (4 TPUs) AlphaGo Zero (4 TPUs)



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??AlphaGo Zero ? 3
????? 490 ??? AlphaGo ?????????????????AlphaGo
Zero 21 ????????????????????? AlphaGo Master ????? -End-