

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 ??????????????
????????????????????AlphaGo ?????? AI ????????????????????????? DeepTech ?????????????????????
DeepMind ????????????????????? AlphaGo ?? 11 ?
10 ???AlphaGoâ€”â€”” ?????????????????????????????????
DeepMind ?????Mastering the game of Go without human knowledge???????????????? Facebook ???
AlphaGo Zero ????????????? AlphaGo ????????????? AlphaGo Zero ???â€”â€””AlphaGo ??????
????????????????DeepMind ?? **DeepMind**
??? 2045 ??????????? 100
??? DeepMind ?????????????????? AlphaGo
Zero??? ?????????????????????????????????



????????????????????DeepMind?? AI ?????????DeepMind
???????????????????? AlphaGo ??????????????????????Aja????????????AlphaGo
???â€”â€””?? A I??????????
? ??? DeepMind ????? AlphaGo
?? Demis Hassabis?DeepMind ? CEO????????????
???AlphaGo ??? AlphaGo
?? AlphaGo
??



?????? AlphaGo Master ??? ?? 60
??
??
??
??
AlphaGo Zero ???
??
??
Erica?????? **DeepMind** **AlphaGo** ??? Demis Hassabis ?
DeepMind AlphaGo ?????? David Silver???????????????????? Google Brain ?????? Chris Maddison ? Ilya
Sutskever?



Demis Hassabis ? David Silver ??? IBM
??
??
??



????? Erica ? 2010 ?????????? 19 ?????????????? 8 cores?Zen ?? 6 ? PC???? Many
Faces of GO ?? 12 cores????????????????????????????????Demis Hassabis
?? DeepMind???????? GO Project
?????????????â€”â€”??? Erica????????????????????????????????AlphaGo ??????????????????
??
??

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.....

? | AlphaGo Master ????? 60 ???AlphaGo
????????????????? ?????? **AlphaGo Zero** AlphaGo Zero ??????????????????
?? 19X19 ?????? ??????
AlphaGo ????????????????????????????????????? AlphaGo Zero ??????? AlphaGo
Master?? AlphaGo Master ??????????????3
??

AlphaGo Zero ?? 2000 ? TPU ????? 40 ??? 40
??AlphaGo Zero
??
?????? **AI** ??? Far
Away?? David Silver ??????AlphaGo
?? DeepMind
?? **DeepMind** ??????? ????????? AlphaGo Zero
??

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

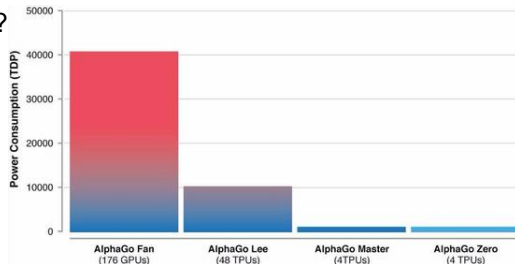
1. AlphaGo Zero 1? AlphaGo Zero
 2? 36 AlphaGo Zero AlphaGo
 v18 AlphaGo Lee 3? 3 AlphaGo Zero ?? AlphaGo v18 ?? 100% ??? 4? ???
 AlphaGo Zero ??? Master ??? Master ??? 60 ??? AlphaGo ??? 5? 40 ??? AlphaGo Zero ??
 Master ??? 90% AlphaGo



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)



????????????????AlphaGo ?????????????? ????? AlphaGo Zero?DeepMind
?????????????â€"â€"????????????????????
??
??AlphaGo Zero ? 3
????? 490 ??? AlphaGo ?????????????????AlphaGo
Zero 21 ????????????????? AlphaGo Master ????? -End-