

编号(学号):

深圳技术大学

本科毕业论文(设计)任务书

(2022 届)

题目: 深度学习方法在肺结节检测中的应用与探索

学 院: 大数据与互联网学院 专 业: 物联网工程

班 级: 2018 级物联网工程 6 班 学 号: 20183220158

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本科生毕业论文（设计）须知

1. 努力学习、勤于实践、勇于创新，保质保量地完成任务书规定的内容。
 2. 独立完成规定的工作任务，不弄虚作假，不抄袭别人的工作内容。
 3. 实验时，爱护仪器设备，节约材料，严格遵守操作规程及实验室有关制度。
 4. 毕业论文（设计）必须符合深圳技术大学 2018 级本科生毕业论文（设计）撰写规范与要求，否则不能取得考核成绩。
 5. 毕业论文（设计）成果、资料应于答辩结束后及时交给学院收存，学生不得擅自带离学校。经指导教师推荐可作为论文发表。
 6. 妥善保存《深圳技术大学本科毕业论文（设计）任务书》。
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<p>题目名称：深度学习方法在肺结节检测中的应用与探索</p>
<p>一、毕业论文(设计)基本内容与要求：</p> <p>肺癌是人类世界最常见的疾病之一，也是造成当今人类死亡率上升的原因之一。根据 2020 年国家癌症中心发布的全国癌症病情统计数据，肺癌的发病率和死亡率位居首位，新发肺癌数达 82 万，死亡人数达 71 万，占癌症死亡总数的 23.8%。此外，肺癌及相关恶性肿瘤的治疗花费超过 2,200 亿元，形势十分严峻。</p> <p>早期诊断和早期治疗是降低肺癌死亡率的有效途径。肺结节作为早期肺癌最典型的表现形式，准确检测肺结节具有极其重要的临床意义。然而，肺结节的形态特征和周围环境较为复杂，且可能被误认为邻近器官。临床上一般通过观察肺部 CT 图像进行肺结节的诊断判别，但随着医疗需求的快速增长，CT 图像数据量不断增加，仅凭放射科医生肉眼评估和诊断，需要消耗大量的时间和精力，易造成漏诊或误诊等问题。因此，肺结节早期检测任务具有一定的挑战性。计算机辅助诊断系统可以帮助医生对肺结节进行检测，降低误诊率和漏诊率，有效提高检测效率和精确度，对肺癌的早期检测具有重要意义，而且在一定程度上能够降低肺癌患者的死亡风险。于是，基于深度学习方法的计算机辅助诊断技术成为医生诊断过程中强有力的工具。然而，肺结节的特殊性以及周围环境的复杂性使得现有肺结节检测与诊断系统不能满足实际要求。</p> <p>近期有研究表明，深度学习方法在肺结节检测与识别方面具有独特而又强大的能力，因此，为了提高肺结节检测的准确性，探索深度学习方法在肺结节检测中的应用是很有必要的。根据毕业设计的内容与要求，研究的步骤如下：</p> <ol style="list-style-type: none"> 1、收集肺结节检测的资料并阅读参考文献； 2、探索学习不同的网络模型，对比现有的深度学习方法； 3、编写深度学习方法的代码，实现对肺结节的检测； 4、探索肺结节检测中深度学习方法的创新及应用。
<p>二、进度安排：</p> <p>2021.11.18-2021.11.30 收集资料并阅读参考文献；</p> <p>2021.12.1-2021.12.15 对比现有深度学习方法在肺结节检测中的应用；</p> <p>2021.12.16-2022.1.25 编写深度学习方法的代码；</p> <p>2022.2.16-2022.3.16 探索肺结节检测的创新方法，撰写论文初稿。</p> <p>2022.3.17-2022.4.1 修改论文。</p>
<p>三、需收集的资料和指导性参考文献：</p> <p>[1] Tran GS,Ngheiem TP,Nguyen VT, et al. Improving Accuracy of Lung Nodule Classification Using Deep Learning with Focal Loss[J]. Journal of Healthcare Engineering, 2019, 2019.</p> <p>[2] Shen S,Han SX,Aberle DR, et al. An Interpretable Deep Hierarchical Semantic Convolutional Neural Network for Lung Nodule Malignancy Classification[J]. Expert Systems with Applications, 2019, 128: 84-95.</p> <p>[3] Li W,Cao P,Zhao D, et al. Pulmonary Nodule Classification with Deep Convolutional Neural Networks on Computed Tomography Images[J]. Computational and Mathematical Methods in Medicine, 2016, 2016.</p> <p>[4] Hesamian MH,Jia W,He X, et al. Atrous Convolution for Binary Semantic Segmentation of Lung Nodule[C]//Icassp 2019-2019 Ieee International Conference on Acoustics, Speech and Signal Processing (icassp): Ieee, 2019: 1015-1019.</p>

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四、选题信息：

选题性质：设计 ☒ 论文 ☐

选题来源：1. 科研项目 国家级 ☐ 省部级 ☐ 其他： ☒

项目编号： _____

2. 实践项目 ☐

3. 自拟题目

教师自拟 ☒

学生共拟 ☐

师生共拟 ☐

指导教师签名： _____

学院领导意见：

签名：

11/11/11