Chen Qiu

Contact：+86 18900310918
Email:qiuch6@mail2.sysu.edu.cn

EDUCATION

Sun Yat-Sen University
Bachelor of Physics, School of physics and Astronomy | GPA 3.7/4.0
Advisor*: prof. Nicola R. Napolitano*
Key Courses: Probability and Statistics, Linear Algebra, C Programming, Machine Learning and Python Practice
Mathematical Physics Methods, Quantum Mechanics, Electrodynamics
Honors: Scholarship of SYSU from 2019 to 2020, Scholarship of SYSU from 2020 to 2021
Excellent student organization leader of the year 2020-2021

PUBLICATIONS

[1] R. Li, N. R. Napolitano, N. Roy, C. Tortora, F. La Barbera, A. Sonnenfeld, C. Qiu, S. Liu, ***GAlaxy Light profile convolutional neural Networks (GaLNets). I. fast and accurate structural parameters for billion galaxy samples***, Accepted for publication by APJ 2021 11

[2] C. Qiu, R. Li, N. R. Napolitano, C Li, C. Tortora, ***GAlaxy Light profile neural Networks (GaLNets). II. Bulge-Disc decomposition from optical space-based observations***, Reserved for publication by A&A 2022

RESEARCH INTERESTS

• AI application in solving real-world interdisciplinary problems
• Reinforcement Leaning, Multi-model analysis (image, video, text etc.), Interactive Intelligent technologies

RESEARCH EXPERIENCES

Chinese Space Station Telescope (CSST) – *Principal Member.* ***2021.10-present***
• Built a database of galaxy images using Cosmo DC2 catalog. Improved our Machine Learning system Galaxy Light profile convolutional neural Networks (GaLNets) to perform Bulge-Disk decomposition on 2-Sérsic high resolute deep galaxy images [GaLNets. II.]. This is the first application using adapted CNN to perform Bulge-Disk decomposition in the world and we achieve a very excellent result in processing high redshift images compared to traditional tools in computational speed and accuracy.

SYSU School of Artificial Intelligence, Team Baoquan Zhao – *Student researcher.* ***2022.03-present***
•Building a video dataset of the conferences on computer vision from YouTube. Developing an intelligent multimedia HMI system using NLP, MSMO and generator as well as other AI technologies to generates Mind-Maps from structural thesis explanation video.

SYSU Artificial Intelligence Lab, Team Tianqi Wei - *Student researcher.* ***2022.02-present***
• Developing a reinforcement learning model teaching Unitree Robotics made quadruped robot to walk like a normal animal based on imitation learning gait. We creatively applied the energy loss rate and attitude stability based on moment vector sum as punishments in this issue.

SYSU School of physics and Astronomy Team Nicola R. Napolitano - *Student researcher.* ***2021.07-2021.12***
• Developed a Machine Learning system Galaxy Light profile convolutional neural Networks (GaLNets) using adapted Convolutional Neural Network(CNN) to process the galaxy images and derive structural parameters on 1-Sérsic galaxy model [GaLNets. I.] our model is the fastest and most accurate model in the world at galaxy images analyzing.

ACADEMIC ACTIVITIES

• Zhiyuan conference Beijing 2022*, attendance*
• CCF-TF International Symposium on Intelligent Multimedia Computing 2022*, attendance*
• China Space Station Telescope (CSST) Technical Workshop 2021*, attendance*
• China Space Station Telescope (CSST) Scientific Conference 2021(postponed due to pandemic) *, presentation*

OTHER EXPERIENCE

Media Center SYSU*, Chairman* ***2020.09-2021.09***
• Leading SYSU media center to finish many promotional activities via both traditional ways and novel media (e.g. WeChat Official account) getting a lot of achievement in advertising our school and received widely acclaim. Most importantly, successfully built an efficient working process and organized personnel structures, which are very beneficial to our successors.

2021 Asia and Pacific Mathematical Contest in Modeling*, Group leader* ***2021.11-2021.11***
• Multi-layer materials were selected to ensure maximum radiant power when light is incident. Using Fresnel's law and Kirchhoff's law, the radiation energy spectrum of the light radiation was calculated; through the selection method, a platform was made on the radiation energy spectrum. Currently, the power reaches the stable power condition. Finally, I won the international first prize of the undergraduate group.

The 11th MathorCup Mathematical Modeling Challenge*, Group leader* ***2021.04-2021.04***
• By constructing a heat conduction model, a good heat dissipation mechanism was constructed to solve the heat dissipation optimization design of the submarine data center. Through the self-created multi-layer binary analysis method, the optimal heat dissipation material was selected, and a large amount of calculation and data processing was performed using Python and MATLAB. Finally, I won the third prize in the undergraduate group.

SKILLS

Python、C、MATLAB、TensorFlow

邱宸

18900310918
Email:qiuch6@mail2.sysu.edu.cn

教育经历

本科-中山大学

物理与天文学院 物理学专业 2023 年毕业 | GPA：3.7/4.0

指导老师：Nicola R. Napolitano

核心课程：概率统计、线性代数、C 程序设计、机器学习 Python 实践、数学物理方法、量子力学、 电动力学

荣誉情况：2020-2021 年度中山大学优秀学生奖学金、2019-2020 年度中山大学优秀学生奖学金
2020-2021 年度中山大学杰出学生组织干部

发表论文

[1] R. Li, N. R. Napolitano, N. Roy, C. Tortora, F. La Barbera, A. Sonnenfeld, C. Qiu, S. Liu, ***GAlaxy Light profile convolutional neural Networks (GaLNets). I. fast and accurate structural parameters for billion galaxy samples***, Accepted for publication by APJ 2021 11

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科研兴趣

•AI 技术在跨学科现实问题中的应用

•强化学习、多模态数据处理分析、智能交互

科研经历

中国空间站望远镜工程 (CSST) –*核心负责人* ***2021.10-至今***

•为中国空间站工程巡天望远镜项目组设计开发了用于区分双组分星系中不同组分的机器学习模型。我们使用 CosmoDC2 目录中提供的星系参数模拟了双组分星系，并改良了我们的 GaLNets 以执行更优的核球盘分解。我们设计的 GaLNets 在很多模型无法做到的高红移核球盘分解过程中可以实现远超国内外同行的精度和计算速度。

中山大学人工智能学院，赵宝全副教授团队 –*研究员* ***2022.03-至今***

•从 YouTube 上获取计算机视觉会议论文讲解视频建立数据库。利用 NLP，MSMO 以及 generator 等技术开发了一套基于多媒体信息处理与分析的人机交互系统，实现了从结构化的论文讲解视频到思维导图的自动转换。

中山大学人工智能研究室，魏天骐副教授团队–*研究员* ***2022.02-至今***

•开发了一套基于强化学习的训练模型，从对正常四足动物的模仿步态出发，我们创新性地引入了能量损耗率以及稳定性作为模型惩罚来实现模拟真实世界的生物演化情况。我们的目标是实现对宇树科技的四足机械狗进行正常步态训练，最终达到模拟四足动物的正常步态的目标。

中山大学物理与天文学院，Nicola R. Napolitano 教授团队 –*研究员* ***2021.07-2021.12***

•我们开发了一系列有监督的卷积神经网络(GaLNets)来推导 Sérsic 配置文件星系的参数。我们将 GaLNets 的结构参数结果与以 2DPHOT 为代表的传统拟合工具在 KiDs 观测数据上进行了一系列对比。结果表明，GaLNet-2 可以达到与 2DPHOT 一样高的准确度并且我们开发的 GaLNets 的计算速度比标准方法快三个数量级。

学术活动

• 2022 北京智源大会,*参会*

• 2022CCF-TF 智能多媒体计算全球座谈会，*参会*

• 2022 中国空间站望远镜工程技术研讨会,*参会*

• 2021 中国空间站望远镜工程年度学术会议(因疫情延期),*展示*

其他经历

中山大学新媒体中心 **主任** **2022.01-2023.01**

•带领新媒体中心开展了各种线上线下的工作，很好地执行了包括公众号运营等学校宣传的各种任务，组织了如 20 届入学迎新活动、天琴计划及天琴中心的宣传片拍摄等一系列重要活动。构建了一套有序且高效的人员架构体系和工作流程安排，为后来的接任者提供了很好的基础。

2021 年 APMCM 亚太地区大学生数学建模大赛 **队长** **2021.11-2021.11**

•选择多层材料，保证光入射时有最大的辐射功率，利用菲涅尔定律及基尔霍夫定律，计算出光辐射的辐射能谱。通过选择法，在辐射能谱上制作一个平台，此时功率在平台上达到功率平稳的条件。最终获得本科组一等奖。

第十一届 MathorCup 高校数学建模挑战赛 **队长** **2021.04-2021.04**

•通过构建热传导模型，构建良好的散热结构，求解海底数据中心的散热优化设计。通过自创的多层二进制分析法，选择出最优散热材料，并利用 Python、MATLAB 进行了大量计算与数据处理。最终获得本科组三等奖。

基本技能

Python、C、MATLAB、TensorFlow