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专 业 技 术 职 务： 教 授（校聘）

目录

一、最后学历、学位证书

南京信息工程大学

NANJING UNIVERSITY OF INFORMATION SCIENCE AND TECHNOLOGY

博士研究生

毕业证书

田伟
2009301014

田伟，男，一九八〇年九月二十五日生。于二〇〇九年九月至二〇一六年六月在气象学专业学习，学制三年，修完博士研究生培养计划规定的全部课程，成绩合格，毕业论文答辩通过，准予毕业。

校长：蒋建清

证书编号：103001201601000009

二〇一六年六月二十一日

南京信息工程大学
NANJING UNIVERSITY OF INFORMATION SCIENCE AND TECHNOLOGY

普通高等学校

博士学位证书

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学位评定委员会主席：蒋建清

证书编号：1030022016000009

二〇一六年六月二十一日

二、近五年公开发表的代表作首页（部分）

1、TCIP-Net: Quantifying Radial Structure Evolution for Tropical Cyclone Intensity Prediction

IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING, VOL. 62, 2024 4109314

TCIP-Net: Quantifying Radial Structure Evolution for Tropical Cyclone Intensity Prediction

Wei Tian, Yuanyuan Chen, Ping Song, Haifeng Xu, Liguang Wu, Yonghong Zhang, Chunyi Xiang, and Shifeng Hao

***Abstract*— Tropical cyclones (TCs) are among the most deadly and damaging natural disasters in coastal areas worldwide. Traditional forecasting methods face challenges as they neglect crucial spatial information related to intensity changes and require substantial human and material resources. Moreover, current deep learning approaches often rely on reanalysis of data from observations far from land, making them challenging to acquire and operationalize. In response to these issues, the article introduces the TC intensity prediction network (TCIP-Net), which, while maintaining interpretability, successfully extracts rich convective structural information from the infrared (IR) channel of satellite imagery. We present the spatio-temporal evolution trajectory of TC radial structural information through Hovmöller diagrams. In addition, we construct a subnetwork with one backbone convolution and four branch convolution operations to extract asymmetric information of TC structure. The convective core (CC) reveals the distribution of convective systems around the eye, aiding in targeted attention to convective information in IR imagery. The model aims to quantitatively explain the contributions of satellite imagery (IR and microwave), convective structure, and key physical factors to the TC intensity prediction task. We utilize multiple TC cases to assess and validate the applicability and effectiveness of the model. The results indicate that TCIP-Net achieved good performance. This approach provides practical guidance for predicting TC intensity using advanced artificial intelligence-based methods and is expected to complement operational models.**

***Index Terms*— Asymmetric information, convective core (CC), convective structural information, tropical cyclone intensity prediction network (TCIP-Net).**

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I. Introduction

TROPICAL cyclones (TCs), as one of the most destructive meteorological phenomena in the natural world, exhibit particularly high activity in the Northwest Pacific basin. They have severe and widespread impacts on human societies, including casualties, damage to housing and infrastructure, flooding, storm surges, tsunamis, agricultural and fisheries losses, and various socio-economic effects. The economic losses caused by TC show an exponential relationship with TC intensity. To effectively mitigate the impact of TC-induced disasters, a series of measures must be swiftly implemented. Early prediction not only safeguards the lives and property of the people but also guides emergency response and resource allocation, thereby minimizing casualties and property losses to the greatest extent possible. Therefore, TC intensity prediction plays an indispensable and crucial role in modern disaster management.

TC intensity is typically defined by the maximum sustained wind (MSW) speed or the minimum sea level pressure (MSLP) at the TC center, which are key metrics for quantifying the severity of a TC. These metrics are influenced by multiple factors. There exists a physical relationship between the cloud patterns observed in satellite imagery and TC intensity. Based on the assumption that TC with similar cloud features has similar intensities, high (low) intensity TC typically exhibits a well-defined (obscured) eye and a high degree of (non)axisymmetry. Therefore, researchers can leverage satellite imagery to build models that learn TC cloud features to estimate and predict TC intensity. This task can be framed as a spatio-temporal regression problem, where the dynamic features of cloud patterns over time in satellite imagery are analyzed and modeled to predict TC intensity. This approach not only utilizes spatial information but also incorporates temporal dynamics, providing a more accurate and comprehensive basis for TC intensity prediction.

Early TC intensity predictions primarily relied on empirical models, which were based on meteorologists' expertise and basic observational data. With the advancement of computational capabilities, numerous numerical [1] and statistical models [2] have been developed to provide predictive guidance for future TC intensity changes. Although these methods have achieved a degree of success, they still face challenges in accuracy, flexibility, and real-time performance due to the complex dynamics of TC.

2、 RadarNet: A parallel spatiotemporal encoder network for radar extrapolation

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RadarNet: A parallel spatiotemporal encoder network for radar extrapolation

Wei Tian [a,b,*], Lei Yi [a], Xianghua Niu [c], Rong Fang [d], Lixia Zhang [d], Huanhuan Liu [a], Zhuo Xu [a], Shengqin Jiang [a,b], Yonghong Zhang [e,f]

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ABSTRACT

Radar extrapolation has been one of the most important means for nowcasting. Most current models achieve good performance in high-frequency sequences (e.g., video, more than 24 fps), while the temporal resolution of radar echo sequences is much lower (1 frame every 6 min) and the transforms are much more complex. The spatiotemporal characters with some similarities would not change a lot in video sequences; however, the radar echo sequences include more intangible changes (e.g., the echo evolution of generation or vanish, and so on), which leads to unique distinct spatial and temporal characters, respectively. Therefore, the singular peculiarity would be mitigated, leading to a rapid decline in precision and sharpness during the extrapolation process. In general, temporal feature extraction is utilized to understand the variation in pixel locations, while spatial feature extraction is employed to capture the distribution variation of specific regions. In this work, we propose a feature decomposition network, termed as RadarNet to improve the extrapolation precision. The parallel independent encoders are used to enhance multi-scale spatial feature extraction and temporal motion feature capture of radar echoes, respectively. In addition, we design a specialized cross fusion mechanism to achieve the inputs of the decoder which may enhance the performance of the extrapolation. The extrapolation experiments are conducted on real radar echo datasets from Shijiazhuang and Nanjing that demonstrate the effectiveness of our model.

1. Introduction

As a challenging task in the field of weather forecasting, convective precipitation forecasting is particularly important for the relevant authorities to take timely action to avoid large-scale losses at the societal level. Therefore, the generation of high accuracy and resolution radar echo images in a short period of time has become a hot topic in convective precipitation forecasting. As one of the fundamental remote sensing instruments, the weather radar plays an important role in convective precipitation forecasting. With the advantage of high spatiotemporal resolution and close correlation to meteorological conditions, the detected radar echo serves as the forecaster to identify and classify weather systems [1]. Especially, it is possible to forecast the weather condition through the prediction of intensity and distribution of radar reflectivity based on pre-existing radar echo observations. Thus, radar extrapolation becomes one of the most feasible technologies for nowcasting [2].

Traditionally, methods for radar extrapolation such as centroid tracking [3], cross-correlation [4], and optical flow [5] just calculate motion vectors based on the hypothesis that it is a kind of rigid body motion which leads to the low precision and short forecasting time-validity. Recently, researches on spatiotemporal sequence prediction, which is actually the essential problem of radar extrapolation, have achieved great improvements compared with the traditional methods [6,7]. Some approaches harness the power of generative adversarial networks to model intricate atmospheric chaotic dynamics, enabling real-time high-resolution prediction. Yet, achieving efficiency in prediction necessitates substantial investment in training data and numerous parameter adjustments, posing significant costs [8,9]. Considering the sensitivity of recurrent neural networks to temporal dependencies, additional methods integrate efficient spatial feature extraction modules with recurrent network units to achieve spatiotemporal modeling [10, 11]. However, they are still trapped in a long-term prediction dilemma

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3、Short-Term Intensity Prediction of Tropical Cyclones Based on Multi-Source Data Fusion with Adaptive Weight Learning

remote sensing

MDPI

Article

Short-Term Intensity Prediction of Tropical Cyclones Based on Multi-Source Data Fusion with Adaptive Weight Learning

Wei Tian [1,*], Ping Song [2], Yuanyuan Chen [1], Haifeng Xu [1], Cheng Jin [3] and Kenny Thiam Choy Lim Kam Sian [4]

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Abstract: Tropical cyclones (TCs) can cause significant economic damage and loss of life in coastal areas. Therefore, TC prediction has become a crucial topic in current research. In recent years, TC track prediction has progressed considerably, and intensity prediction remains a challenge due to the complex mechanism of TC structure. In this study, we propose a model for short-term intensity prediction based on adaptive weight learning (AWL-Net) for the evolution of the TC's structure as well as intensity changes, exploring the multidimensional fusion of features including TC morphology, structure, and scale. Furthermore, in addition to using satellite imageries, we construct a dataset that can more comprehensively explore the degree of TC cloud organization and structure evolution. Considering the information difference between multi-source data, a multi-branch structure is constructed and adaptive weight learning (AWL) is designed. In addition, according to the three-dimensional dynamic features of TC, 3D Convolutional Gated Recurrent (3D ConvGRU) is used to achieve feature enhancement, and then 3D Convolutional Neural Network (CNN) is used to capture and learn TC temporal and spatial features. Experiments on a sample of northwest Pacific TCs and official agency TC intensity prediction records are used to validate the effectiveness of our proposed model, and the results show that our model is able to focus well on the spatial and temporal features associated with TC intensity changes, with a root mean square error (RMSE) of 10.62 kt for the TC 24 h intensity forecast.

Keywords: tropical cyclone; intensity prediction; remote sensing data; adaptive weight learning

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1. Introduction

The tropical cyclone (TC) occurs oi the tropical or subtropical ocean, with sufficient ocean temperature and water vapor as the support of its development, and is a weather system with organized convection. Since the landfall of a TC is always accompanied by storms and floods, tsunamis, mudslides, etc., it destroys buildings and facilities, leading to large-scale damage, causing huge social and economic losses to coastal areas and seriously damaging human life and property safety [1–3]. For example, Hurricane Katrina struck New Orleans and its surrounding areas in the United States in August 2005. It had wind speeds reaching up to 175 miles per hour and a storm surge of 20 feet, resulting in the death of 1800 people and causing economic losses exceeding USD 125 billion. Typhoon Haiyan made landfall in the central Philippines in November 2013 with wind speeds of up to 195 miles per hour, making it one of the strongest recorded typhoons. The storm surge of more than 13 feet and brought heavy precipitation, triggering severe flash floods and mudslides. The typhoon caused over 6000 deaths and resulted in significant damage to infrastructure, farmlands, and villages. Therefore, predicting TC activity is the key to

4、A Lightweight Multi-Task Learning Model With Adaptive Loss Balance for Tropical Cyclone Intensity and Size Estimation

IEEE JOURNAL OF SELECTED TOPICS IN APPLIED EARTH OBSERVATIONS AND REMOTE SENSING, VOL. 16, 2023 1057

A Lightweight Multitask Learning Model With Adaptive Loss Balance for Tropical Cyclone Intensity and Size Estimation

Wei Tian, Xinxin Zhou, Xianhua Niu, Linhong Lai, Yonghong Zhang, and Kenny Thiam Choy Lim Kam Sian

Abstract—**Accurate tropical cyclone (TC) intensity and size estimation are key in disaster management and prevention. While great breakthroughs have been made in TC intensity estimation research, there is currently a lack of research on TC size reflecting TC influence radius. Therefore, we propose a lightweight multi-task learning model (TC-MTLNet) with adaptive loss balance to simultaneously estimate TC intensity and size. Adaptive loss balance is utilized to solve the problem of inconsistent convergence speed of TC intensity and size estimation tasks. The model based on four 2-D convolutions, four 3-D convolutions and three fully connected layers takes up less computational and storage space and improves the accuracy of TC intensity and size estimation by sharing knowledge among multiple tasks. In addition, due to the imbalanced distribution of TC samples, with significantly few low-intensity and high-intensity TC satellite data, this phenomenon poses a great challenge to TC intensity and size estimation. So, we utilize the influence of nearby samples to calibrate the sample density to weight the loss function to enable the model to be generalized to all samples. The result shows that the root-mean-square error (RMSE) of TC intensity estimation is 8.40 kts, which is 33.5% lower than that of the Advanced Dvorak Technique (ADT) and 11.4% lower than that of the deep learning method (3DAttentionTCNet). The mean absolute error (MAE) of the TC size estimation is 20.89 nmi, which is a 16% reduction compared to the Multi-Platform Tropical Cyclone Surface Winds Analysis (MTCSWA).**

Index Terms—**Balanced data distribution, dual attention, lightweight multitask learning model, tropical cyclone (TC) intensity, TC size.**

I. Introduction

TROPICAL cyclones (TCs) are phenomena with extremely low central pressure, forming over the tropical ocean and eventually dissipating at sea or after moving over land. Landfalling TCs are accompanied by severe weather such as strong wind, rainstorms, and storm surges, which can cause significant loss of life and property [1], [2]. TC intensity is defined as the maximum average wind speed near the TC center. It is an important parameter that measures the destructive power of TC and is used in TC warning, prevention, and management. Accurate TC intensity estimation also helps to predict the rapid intensification of TC intensity. TC size indicates the radius of TC influence. TC size is usually measured by several wind radii provided by the forecast centers, including the gale-radius (35 kts, R35), storm-radius (50 kts, R50), hurricane-radius (64 kts, R64) and the radius of maximum wind (RMW) [3], [4], [5], [6], [7]. R35 represents the potential impact area of a TC and is one of the most widely used parameters to predict TC influence and mitigate TC impact. Thus, the present study conducts TC size estimations based on R35.

Obtaining TC observations is difficult because TCs spend most of their lifetime over the ocean, where deploying observation equipment is challenging. Therefore, aircraft and ships are used to obtain TC observations at sea. However, these observational methods are very expensive. With the development of artificial intelligence, satellite imagery has become the main source of information for TC intensity estimation. Although satellite imagery cannot directly measure TC intensity, it can be estimated indirectly through the captured cloud structure [8], [9]. For example, infrared satellite imagery provides the temperature distribution of radiation surfaces, water vapor satellite imagery provides information on the water vapor in the clouds, and microwave satellite imagery provides information such as the TC eye, eyewall and spiral rainbands. TC intensity estimation using satellite imagery is based on the fact that TCs of similar intensities have similar cloud structures. In meteorology, the main TC intensity estimation methods include the Dvorak technique [10], the advanced Dvorak technique (ADT) [11], the deviation angle variance technique (DAV) [12], and the satellite consensus technique (SATCON) [13], [14], [15]. These methods rely on artificial experience or various algorithms to obtain features related to TC intensity and then use regression models to obtain TC intensity. However, the cloud structure features related to TC intensity determined by humans are subjective. In addition, the design of feature extraction algorithms requires expertise, which greatly limits TC intensity estimation. With the development of deep learning technology, intensity estimation

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5、Short-Term Rolling Prediction of Tropical Cyclone Intensity Based on Multi-Task Learning with Fusion of Deviation-Angle Variance and Satellite Imagery

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• Original Paper •

Short-Term Rolling Prediction of Tropical Cyclone Intensity Based on Multi-Task Learning with Fusion of Deviation-Angle Variance and Satellite Imagery※

Wei TIAN*[1], Ping SONG[2], Yuanyuan CHEN[1], Yonghong ZHANG[3], Liguang WU[4], Haikun ZHAO[5], Kenny Thiam Choy LIM KAM SIAN[6], and Chunyi XIANG[7]

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ABSTRACT

Tropical cyclones (TCs) are one of the most serious types of natural disasters, and accurate TC activity predictions are key to disaster prevention and mitigation. Recently, TC track predictions have made significant progress, but the ability to predict their intensity is obviously lagging behind. At present, research on TC intensity prediction takes atmospheric reanalysis data as the research object and mines the relationship between TC-related environmental factors and intensity through deep learning. However, reanalysis data are non-real-time in nature, which does not meet the requirements for operational forecasting applications. Therefore, a TC intensity prediction model named TC-Rolling is proposed, which can simultaneously extract the degree of symmetry for strong TC convective cloud and convection intensity, and fuse the deviation-angle variance with satellite images to construct the correlation between TC convection structure and intensity. For TCs' complex dynamic processes, a convolutional neural network (CNN) is used to learn their temporal and spatial features. For real-time intensity estimation, multi-task learning acts as an implicit time-series enhancement. The model is designed with a rolling strategy that aims to moderate the long-term dependent decay problem and improve accuracy for short-term intensity predictions. Since multiple tasks are correlated, the loss function of 12 h and 24 h are corrected. After testing on a sample of TCs in the Northwest Pacific, with a 4.48 kt root-mean-square error (RMSE) of 6 h intensity prediction, 5.78 kt for 12 h, and 13.94 kt for 24 h, TC records from official agencies are used to assess the validity of TC-Rolling.

Key words: tropical cyclone, intensity, structure, rolling prediction, multi-task

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Article Highlights:

- Tropical cyclone structure is quantified to guide intensity prediction.
- Loss function designed to correct cumulative error generated by rolling forecasts and the temporal relationship of the forecasting task.

1. Introduction

Tropical cyclones (TCs) are powerful, deep, and organized weather systems, with the airflow rotating and converging to the center, forming a strong cyclone and low pressure vortex with a warm-core structure. The occurrence of TCs plays a role in regulating climate, alleviating droughts, and maintaining ecological balance, but TC intensity changes quickly. Their strong, sudden, destructive force and wide coverage make TCs one of the most deadly and damaging types

※ This paper is a contribution to the special issue on AI Applications in Atmospheric and Oceanic Science: Pioneering the Future.

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6、Estimation of Tropical Cyclone Intensity Using Multi-Platform Remote Sensing and Deep Learning with Environmental Field Information

remote sensing

MDPI

Article

Estimation of Tropical Cyclone Intensity Using Multi-Platform Remote Sensing and Deep Learning with Environmental Field Information

Wei Tian [1,*], Linhong Lai [1], Xianghua Niu [2], Xinxin Zhou [1], Yonghong Zhang [3,4,5] and Kenny Thiam Choy Lim Kam Sian [4]

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Abstract: Accurate tropical cyclone (TC) intensity estimation is crucial for prediction and disaster prevention. Currently, significant progress has been achieved for the application of convolutional neural networks (CNNs) in TC intensity estimation. However, many studies have overlooked the fact that the local convolution used by CNNs does not consider the global spatial relationships between pixels. Hence, they can only capture limited spatial contextual information. In addition, the special rotation invariance and symmetry structure of TC cannot be fully expressed by convolutional kernels alone. Therefore, this study proposes a new deep learning-based model for TC intensity estimation, which uses a combination of rotation equivariant convolution and Transformer to address the rotation invariance and symmetry structure of TC. Combining the two can allow capturing both local and global spatial contextual information, thereby achieving more accurate intensity estimation. Furthermore, we fused multi-platform satellite remote sensing data into the model to provide more information about the TC structure. At the same time, we integrate the physical environmental field information into the model, which can help capture the impact of these external factors on TC intensity and further improve the estimation accuracy. Finally, we use TCs from 2003 to 2015 to train our model and use 2016 and 2017 data as independent validation sets to verify our model. The overall root mean square error (RMSE) is 8.19 kt. For a subset of 482 samples (from the East Pacific and Atlantic) observed by aircraft reconnaissance, the root mean square error is 7.88 kt.

Keywords: tropical cyclone intensity; multi-platform remote sensing data fusion; remote sensing; rotation equivariant convolution; attention mechanism and transformer

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Citation: Tian, W.; Lai, L.; Niu, X.; Zhou, X.; Zhang, Y.; Sian, K.T.C.L.K. Estimation of Tropical Cyclone Intensity Using Multi-Platform Remote Sensing and Deep Learning with Environmental Field Information. *Remote Sens.* **2023**, *15*, 2085. https://doi.org/10.3390/rs15082085

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1. Introduction

Tropical cyclones (TCs) are catastrophic weather phenomena that can significantly impact human life. The strong winds and heavy rainfall that accompany these systems can cause substantial damage to property and hinder social and economic development in the affected regions. Therefore, accurately estimating the intensity of TC is of great significance for both theoretical research and practical applications.

The most widely used method for estimating TC intensity is the Dvorak technique [1], which relates the rotation, eye shape, and thunderstorm activity of a TC to its strengthening or weakening. This technique assumes that cyclones with similar intensities often have similar patterns and requires expert analysis of visible and infrared satellite images of

三、近五年主持完成或正在主持的科研项目材料

1. 基于卷积神经网络有效融合环境场信息的热带气旋强度估计研究

国家自然科学基金面上项目，基于卷积神经网络有效融合环境场信息的热带气旋强度估计研究（42075138），2021.01-2024.12，58 万，主持；在研（结题报告基金委已审核通过）

项目批准号	42075138
申请代码	D0510
归口管理部门	
依托单位代码	21004408A0692-1259

420751381007975

国家自然科学基金委员会

资助项目计划书

资助类别： 面上项目

亚类说明：

附注说明：

项目名称： 基于卷积神经网络有效融合环境场信息的热带气旋强度估计研究

直接费用： 58万元 **执行年限：** 2021.01-2024.12

负 责 人： 田伟

通讯地址： 南京市宁六路219号

邮政编码： 210044 **电 话：** 025-58731323

电子邮件： tw@nuist.edu.cn

依托单位： 南京信息工程大学

联 系 人： 刘竹青 **电 话：** 025-58731154

填表日期： 2020年10月08日

国家自然科学基金委员会制

Version：1.007.975

简表

<table>
<tr><td rowspan="6">项目负责人信息</td><td>姓　　名</td><td>田伟</td><td>性 别</td><td>男</td><td>出生年月</td><td>1980年09月</td><td>民 族</td><td>汉族</td></tr>
<tr><td>学　　位</td><td colspan="3">博士</td><td>职称</td><td colspan="3">副教授</td></tr>
<tr><td>是否在站博士后</td><td colspan="2">否</td><td colspan="2">电子邮件</td><td colspan="3">tw@nuist.edu.cn</td></tr>
<tr><td>电　　话</td><td colspan="2">025-58731323</td><td colspan="2">个人网页</td><td colspan="3"></td></tr>
<tr><td>工 作 单 位</td><td colspan="7">南京信息工程大学</td></tr>
<tr><td>所 在 院 系 所</td><td colspan="7">计算机与软件学院</td></tr>
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<tr><td rowspan="7">项目基本信息</td><td>项 目 名 称</td><td colspan="7">基于卷积神经网络有效融合环境场信息的热带气旋强度估计研究</td></tr>
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<tr><td>执 行 年 限</td><td colspan="7">2021.01-2024.12</td></tr>
<tr><td>直 接 费 用</td><td colspan="7">58万元</td></tr>
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项目摘要

中文摘要：

准确估算热带气旋（TC）强度是TC预报和灾害预警的关键。德沃夏克技术（Dvorak）被广泛应用于TC定强，深度学习在TC强度估计表现出与Dvorak相当的水平。然而，Dvorak定强方法的主观性及洋盆间的不一致性，以及当前深度学习估计强度仅使用卫星观测资料，迫切需要客观、多资料融合的深度学习模型来提升TC强度估计的准确性。为此，1）将构建用于强度估计TC立体时空信息；2）利用卫星图像和环境场信息建立基于卷积神经网络TC强度估计模型，生成自动抽取强度特征、相对独立、洋盆一致、客观的TC强度新资料集；3）利用动力降尺度TC强度模式资料检验强度新资料，通过深度学习的可解释性深入认识影响TC强度估计和变化的重要因子。预期项目完成将提出融合环境大数据的深度学习定强方法，克服当前TC定强存在的不足，有助于提高TC强度估计水平，同时将为深度学习在气象领域深度融合提供重要示范。

Abstract:

Accurate estimation of tropical cyclone (TC) intensity is the key to TC prediction and disaster warning. Dvorak technology (Dvorak) is widely used for TC strength determination internationally, and deep learning is comparable to Dvorak in TC strength estimation. However, due to the subjectivity of Dvorak's intensity determination method and the inconsistency between ocean basins, as well as the fact that only satellite observation data are used to estimate the intensity of deep learning, an objective and multi-data fusion deep learning model is urgently needed to improve the accuracy of TC intensity estimation. For this purpose, 1) a set of multi-channel cloud map TC intensity estimation data set will be established;2) using satellite images and environmental field information, build a TC strength estimation model based on convolutional neural networks, and generate new data sets of TC strength that automatically extract strength characteristics, are relatively independent, consistent and objective;3) verify the new strength data constructed by using the TC strength model of dynamic downscaling, and further understand the important factors affecting the TC strength estimation and change through the interpretability of deep learning. It is expected that the completion of the project will put forward the method of deep learning intensity determination based on the integration of environmental big data, overcome the shortcomings of current TC intensity determination, improve the estimation level of TC intensity, and provide an important demonstration for the deep integration of deep learning in the field of meteorology.

关键词(用分号分开)：热带气旋强度估计；卷积神经网络；环境场信息；多通道卫星资料

Keywords(用分号分开): Tropical cyclone intensity estimation; Convolutional Neural Network; Environmental information; Multi-channel satellite data

2. 融合对流结构信息的热带气旋强度短期预测方法研究

国家自然科学基金面上项目（42375147），融合对流结构信息的热带气旋强度短期预测方法研究, 2024.01-2027.12,　51 万，主持，在研

项目批准号	42375147
申请代码	D0510
归口管理部门	
依托单位代码	21004408A0692-1259

423751471003662

国家自然科学基金

资助项目计划书

（预算制项目）

资助类别：面上项目

亚类说明：

附注说明：

项目名称：融合对流结构信息的热带气旋强度短期预测方法研究

直接费用：51万元　　执行年限：2024.01-2027.12

负 责 人：田伟

通讯地址：南京市宁六路219号

邮政编码：210044　　电　　话：025-58731323

电子邮件：tw@nuist.edu.cn

依托单位：南京信息工程大学

联 系 人：刘竹青　　电　　话：025-58731154

填表日期：2023年09月04日

国家自然科学基金委员会制

Version：1.003.662

简表

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<tr><td>所 在 院 系 所</td><td colspan="7">计算机学院、网络空间安全学院</td></tr>
<tr><td rowspan="3">依托单位信息</td><td>名　　称</td><td colspan="5">南京信息工程大学</td><td>代码</td><td>21004408A0692</td></tr>
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<tr><td>直 接 费 用</td><td colspan="7">51万元</td></tr>
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项目摘要

中文摘要：

准确的热带气旋（TC）强度预测是防灾减灾的关键，强度变化机理及影响因素复杂，使得热带气旋强度预测极具挑战。目前，数值模式和统计模型存在强度预测精度低、物理过程认识有限等问题，而基于再分析资料的深度学习强度预测模型存在主要影响因子选取主观、难以转化业务预报等问题。迫切需要融合物理因子的深度学习模型提升TC强度预测的准确性，因此，1）利用卫星观测资料构建TC对流结构信息，提供强度变化的指标；2）采用自回归网络预测TC亮温径向结构；3）基于卷积神经网络提取卫星图像和对流结构的特征，构建TC强度短期预测模型，并利用多任务学习机制建立模型对数据的长期依赖，提升强度预测性能。项目旨在提高TC强度预测水平，为热带气旋强度业务预报提供预测辅助指导，具有重要灾害预警与防范的理论和现实意义。

Abstract:

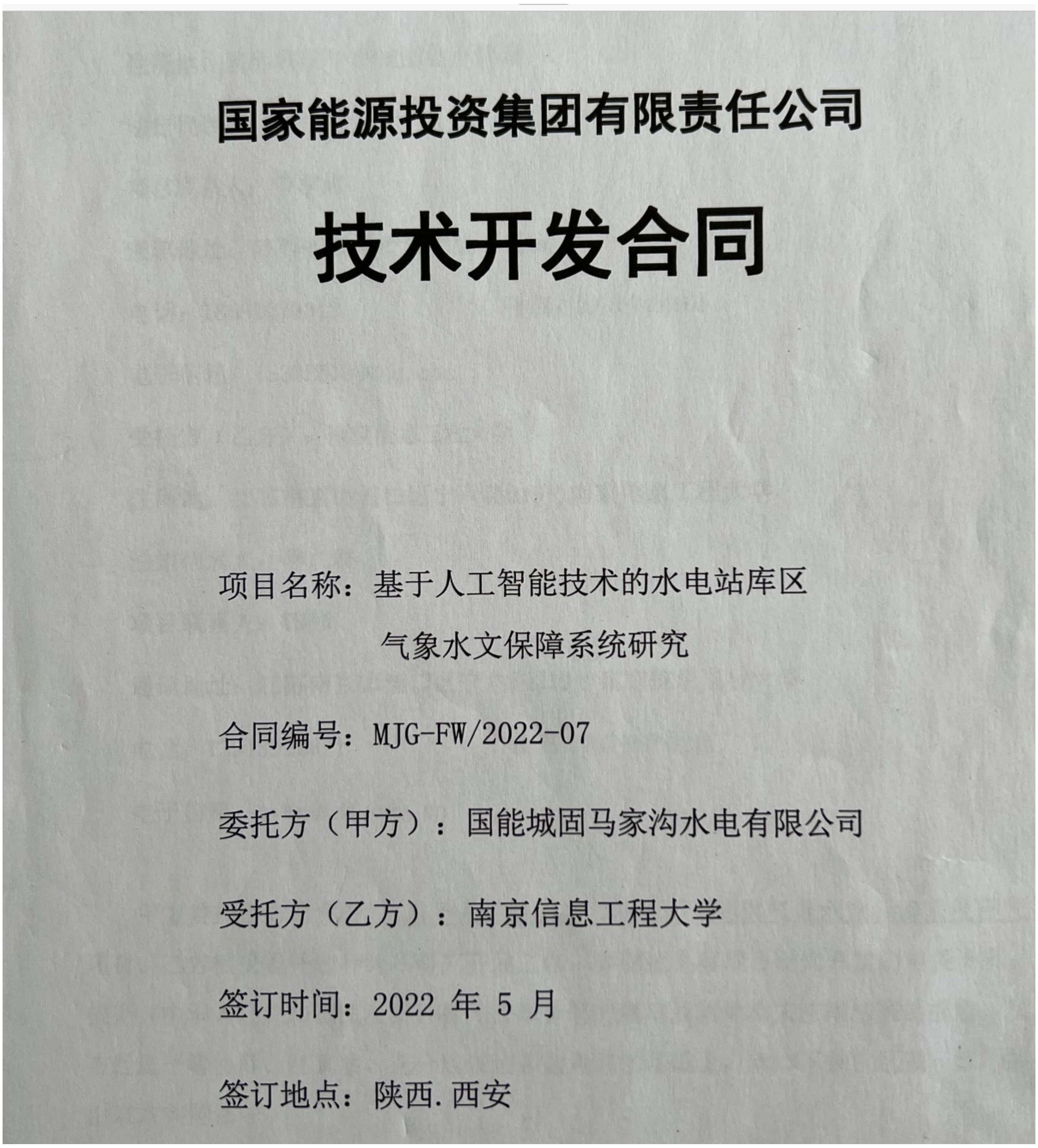
Accurate prediction of tropical cyclone (TC) intensity is the key to disaster prevention and mitigation. The complexity of intensity change mechanisms and influencing factors makes predicting tropical cyclone intensity challenging. At present, numerical models and statistical models have problems such as low intensity prediction accuracy and limited understanding of physical processes, while deep learning intensity prediction models based on reanalysis data have problems such as subjective selection of main influencing factors and difficulty in translating operational forecasts. Deep learning models incorporating physical factors are urgently needed to improve the accuracy of TC intensity prediction. Therefore, 1) satellite observations are used to construct TC convective structure information and provide indicators of intensity change; 2) autoregressive networks are used to predict TC bright temperature radial structure; 3) convolutional neural networks are used to extract features of satellite images and convective structure to construct TC intensity short-term prediction models, and multi-task learning is used to mechanism to establish the long-term dependence of the model on data and improve the intensity prediction performance. The project aims to improve TC intensity prediction and provide forecasting aid guidance for operational forecasting of tropical cyclone intensity, which is of theoretical and practical significance for important disaster warning and prevention.

关键词(用分号分开)： 热带气旋；深度学习；热带气旋对流结构信息

Keywords(用分号分开): Tropical Cyclone; Deep Learning; Tropical Cyclone Convective Structure Information

3. 基于人工智能技术的水电站库区气象水文保障系统研究

国家能源投资集团有限责任公司公开招标项目，基于人工智能技术的水电站库区气象水文保障系统研究， 2022-2023，366.7 万，主持；已结题



国家能源投资集团有限责任公司

技术开发合同

项目名称：基于人工智能技术的水电站库区气象水文保障系统研究

合同编号：MJG-FW/2022-07

委托方（甲方）：国能城固马家沟水电有限公司

受托方（乙方）：南京信息工程大学

签订时间：2022 年 5 月

签订地点：陕西.西安

行及调试改进；论文、专利等研究成果撰写，申请，出版等；

3.1.4 2022 年 12 月中旬前，项目文档准备，结题验收。

第四条 乙方应指派专人开展本合同约定项目的研究开发工作（项目负责人及课题组主要研究人员名单详见附表2：本项目服务人员名单），按照本合同规定的内容、时间和份数向甲方交付研究报告，对提交的研究报告的质量负责，并对研究报告出现的遗漏或错误负责修改或补充。乙方如需变更项目研究的课题组主要成员，须事先征得甲方的书面同意。

第五条 甲方应向乙方提供的技术资料及协作事项如下：

5.1 技术资料清单：马家沟、白果树、狮坝电站大坝、水文等基础资料；

5.2 提供时间和方式：合同签订后，根据乙方需求时间确定，电子版或纸质版资料；

5.3 其他协作事项：驻场服务时，甲方提供办公、用餐等，费用由乙方（受托方）承担。

本合同履行完毕、终止或者一方解除合同后，上述技术资料按以下方式处理：全部归还甲方，包括各种形式的原件和复印件。

第六条 甲方应按以下方式支付本项目合同价款：

6.1 合同总价款（含研究开发经费和报酬总额）为￥3667000.00元，大写（人民币）：叁佰陆拾陆万柒仟元整，本价款包括但不限于的研发费、专利费、利润、税金等乙方为实施本项目所发生的所有费用，除此以外，甲方不再向乙方支付任何费用。乙方应开具国家认可的事业单位收款收据。

6.1.1 预付款的额度和支付约定为：

合同生效后，乙方提交金额为合同总价 10 %的财务收据，发包人审核无误后 40 个工作日内，支付给乙方合同总价的 10 %作为预付款。

6.1.2 进度款额度和支付约定为：（如遇比例无法除尽时，按照接近合同比例实际金额取数）。

甲方单位：国能城固马家沟水电有限公司

（盖章）

法定代表人（委托代理人）：

杨泽

乙方单位：南京信息工程大学

（盖章）

法定代表人（委托代理人）：田伟

4. 利用大数据及人工智能搭建石家庄智能暴雨预报系统

河北省石家庄市公共资源交易中心公开招标项目，利用大数据及人工智能搭建石家庄智能暴雨系统项目, 2019.01-2020.9,　78.6 万，主持，已结题

合同编号：SJZQXJHT2019-45

技术开发（委托）合同

项目名称： 利用大数据及人工智能搭建石家庄智能暴雨预报系统

委托方（甲方）： 石家庄市气象局

受托方（乙方）： 南京信息工程大学

签订时间： 2019 年 6 月 5 日

签订地点： 石家庄

有效期限： 2019 年 6 月至 2020 年 6 月

中华人民共和国科学技术部印制

8、程序涉及的插件需经过授权，不能存在版权疑义。

9、知识产权归双方共同所有。

三、 本合同项目下的服务期限

项目及建设内容执行时间自签订合同之日后一年内完成。系统验收交付后，3 年内负责系统免费维护、改进和升级等服务。

四、 合同金额及支付方式

1、本项目的总价款为人民币柒拾捌万陆仟元整（786,000 元）。

2、付款方式：合同签订后 30 日内，甲方向乙方支付中标金额的 100%。乙方在合同签订 10 日内向甲方提交中标价 5%的履约保证金，甲方在验收合格 30 天之内不计息返还乙方 5%履约保证金。

3、乙方开户银行名称、地址和帐号为：

开户行：中国农业银行南京盘城支行

账户名：南京信息工程大学

账　号：10115401040000228

4、甲方开户银行名称、地址和帐号为：

开户行：建行石家庄八一支行

账户名：石家庄市气象局

账　号：13001615137059111111

五、 双方的权利和义务

1、乙方对甲方提供的资料负有保密义务，未经甲方同意，不得向任何单位和个人提供有关资料，如发生以上情况，甲方有权索赔。

2、系统交付后，乙方 3 年内负责系统免费维护、改进和升级等服务，确保系统安全、稳定、正常地运行；当出现故障时，甲方应立即通知到乙方，乙方 24 小时内响应，提出并执行解决方案，如属于严重故障，乙方立即委派工程师进行处理。

3、乙方须指定一名专业人员与甲方沟通，及时解决项目实施过程中可能出现的问题。乙方每个月向甲方提供项目进展报告，包括工作阶段成果、出现的问题以及解决的办法、下一步工作计划、要关注的主要问题等等。

4、本项目的知识产权归甲乙双方共同所有，未经双方同意，本合同下形成的任何成果文件、资料，均不得向第三方披露或转让。

甲方：石家庄市气象局（盖章）

法定代表人/委托代理人：（签名）

2019 年 6 月 5 日

乙方：南京信息工程大学（盖章）

法定代表人/委托代理人：李小明（签名）

2019 年 6 月 5 日

5. 石家庄市气象局完善暴雨雷达回波识别系统

河北省石家庄市公共资源交易中心公开招标项目，石家庄市气象局完善暴雨雷达回波识别系统项目, 2021.09-2024.09, 56.6 万, 主持，已结题

合同编号：SJZQXJHT2021-102

技术开发（委托）合同

项目名称： 石家庄市气象局完善暴雨雷达回波识别系统项目

委托方（甲方）： 石家庄市气象局

受托方（乙方）： 南京信息工程大学

签订时间： 2021 年 9 月 27 日

签订地点： 石家庄

中华人民共和国科学技术部印制

的风、温度、相对湿度等进行误差订正；基于模式定量降水预报与实况的频率误差分析，采用降水频率订正等方法进行降水偏差订正，形成重要地点的地面要素订正产品。

7、基于统计相关、邻域处理、大数据挖掘等方法，结合历史预报库大数据信息和实时更新的检验评分结果，产生各模式的最优预报权重，建立多模式产品融合方法，对石家庄区域预报进行分析优化形成集成预报产品，获得石家庄市 0-3 天无缝隙预报产品，提高预报准确率。预期优化订正后地面温度预报误差降低 10%-20%；湿度误差降低 5-10%；降水 TS 评分提高 3%-5%。

8、开展地面要素预报效果检验评估，针对 2021-2022 典型高影响天气过程进行对比检验，与预报员实时预报进行比较分析。

9、对技术人员提供不少于 3 人*7 次的免费技术培训。

10、联合撰写 1-2 篇中文核心及 SCI 以上学术论文或申报 1 项科研项目。

11、系统开发 11 个月，稳定试运行 2 个月，组织系统验收，系统交付后，3 年内负责系统免费维护、改进和升级等服务。

12、程序涉及的插件需经过授权，不能存在版权疑义。

13、知识产权归双方共同所有。

第二条 本合同项目下的服务期限为：

项目执行时间自 2021 年 9 月 27 日至 2022 年 11 月 27 日，2021 年 9 月 27 日至 2022 年 8 月 26 日完成系统开发，2022 年 8 月 27 日至 2022 年 10 月 27 日系统稳定试运行，2022 年 11 月 27 日前系统完成验收并交付业务运行。系统验收交付后，3 年内（2025 年 11 月 27 日前）负责系统免费维护、改进和升级等服务。

第三条 合同金额及支付方式

1、本项目的总价款为 人民币伍拾陆万陆仟元整（566,000 元）。

2、付款方式：合同签订后 30 日内，乙方先向甲方提交中标价 5%的履约保证金，甲方再向乙方支付中标金额的 100%，验收合格后退还乙方履约保证金。

3、乙方开户银行名称、地址和帐号为：

开户行： 中国农业银行南京盘城支行

账户名： 南京信息工程大学

账　号： 10115401040000228

4、甲方开户银行名称、地址和帐号为：

部分。

3、如一方地址、电话、传真号码有变更，应在变更当日内书面通知对方，否则，应承担相应责任。

第十三条 合同生效

1、本合同订立时间：2021 年 9 月 27 日

2、本合同订立地点： 石家庄 。

3、本合同在甲乙双方法人代表或其授权代表签字盖章后生效。

4、本合同一式六份，双方各执三份。

甲方：石家庄市气象局（盖章）

法定代表人/委托代理人：张立霞（签名）

2021 年 9 月 27 日

乙方：南京信息工程大学（盖章）

法定代表人/委托代理人：田伟（签名）

2021 年 9 月 27 日

11

6. 石家庄市气象局分类强对流天气临近客观预报产品项目

河北省石家庄市公共资源交易中心公开招标项目，石家庄市气象局完善暴雨雷达回波识别系统项目, 2021.09-2024.09, 56.6 万, 主持，已结题

2024h275

合同编号： SJZQXJHT2024-41

技术开发（委托）合同

项目名称：石家庄市气象局分类强对流天气临近客观预报产品项目

委托方（甲方）： 石家庄市气象局

受托方（乙方）： 南京信息工程大学

签订时间： 2024 年 5 月 22 日

签订地点： 石家庄

中华人民共和国科学技术部印制

5. 乙方人员在石家庄市气象局驻场进行项目开发。

6. 对技术人员提供不少于3人*7次的免费技术培训。

7. 2024年12月31日前完成，项目自验收合格之日起即进入3年系统免费维护、改进和升级等服务。

8. 程序涉及的插件需经过授权，不能存在版权疑义。

9. 知识产权归石家庄市气象局所有。

第二条 本合同项目下的服务期限为：

自合同签订之日起，乙方在2024年12月31日前完成，项目验收合格后，乙方再向甲方提供3年内系统免费维护、改进和升级等服务。

第三条 合同金额及支付方式

1、本项目的总价款为人民币叁拾柒万伍仟元整（¥375,000.00元）。

2、付款方式：合同签订后30日内，乙方先向甲方提交中标价10%的履约保证金，甲方再向乙方支付中标金额的80%，系统进入试运行后，甲方再向乙方支付中标金额的20%，在乙方履约进行的本合同项目通过甲方验收合格后，退还乙方履约保证金。

3、甲方开户银行名称、账户名和账号：

开户行：建行石家庄八一支行

账户名：石家庄市气象局

账号：13001615137059111111

4、乙方开户银行名称、账户名和帐号为：

开户行：中国农业银行南京盘城支行

账户名：南京信息工程大学

账　号：10115401040000228

第四条 双方权利和义务

1、乙方对甲方提供的资料负有保密义务，未经甲方同意，不得向任何单位和个人提供有关资料。如发生以上情况，甲方有权索赔。

2、系统交付后，乙方3年内负责系统免费维护、改进和升级等服务，确保系统安全、稳定、正常地运行；当出现故障时，甲方应立即通知乙方，乙方24小时内响应。

1、本合同订立时间： 2024年5月22日

2、本合同订立地点： 石家庄。

3、本合同在甲乙双方法人代表或其授权代表签字盖章后生效。

4、本合同一式六份，双方各执三份。

甲方： 石家庄市气象局 （盖章）

法定代表人/委托代理人： 张立霞 （签名）

2024 年5 月22日

乙方： 南京信息工程大学 （盖章）

法定代表人/委托代理人： （签名）

2024 年 5月 22日

10

7. 某系统配套积雪监测和极端天气识别应用

合同登记编号：Cu-Cu-002-20230625

某系统配套积雪监测和极端天气识别应用
开发合同

项目名称：某系统配套积雪监测和极端天气识别应用

合同编号：

委托方（甲方）：成都锦江电子系统工程有限公司

受托方（乙方）：南京信息工程大学

签订时间：2023 年 5 月

签订地点：成都市新都区

有效期限：2023 年 5 月至 2024 年 4 月

本合同甲方委托乙方研制 某系统配套积雪监测和极端天气识别应用开发 ，并支付研制经费和报酬，乙方接受委托并进行此项研制工作。双方经过平等协商，在真实、充分地表达各自意愿的基础上，根据《中华人民共和国民法典》的规定，达成如下协议，并由双方共同恪守。

第一条 本合同研究开发项目的要求如下：

本合同开发项目按照 某系统配套积雪监测和极端天气识别应用开发技术协议（编号：WL2023026-JS ）执行。

第二条 乙方应按下列进度完成研究开发工作：

2023 年 6 月 26 日前，乙方完成某系统配套积雪监测和极端天气识别应用开发研制任务并交付。

第三条 乙方应当向甲方交付的研究开发成果：

研究开发成果交付的形式及数量：光盘 1 份，内含某系统配套积雪监测和极端天气识别应用一套、源代码一份、及技术协议要求的配套软件文档。

第四条 甲方应按以下方式支付研究开发经费和报酬：

1. 研究开发经费和报酬总额为：¥ 387000 元（大写：叁拾捌万柒仟元整 ）。

2. 研究开发经费由甲方 分期 （一次，分期或提成）支付乙方，具体支付方式和时间如下：

（1）合同签订后 30 天内，甲方支付 30%的合同预付款，即¥116100 元（大写：壹拾壹万陆仟壹佰元整）。

（2）最终用户方验收合格、系统测试且稳定运行后，乙方开具全额 3%增值税专用发票，甲方于 30 天内支付 65%验收款，即¥ 251550 元（大写：贰拾伍万壹仟伍佰伍拾元整）；

3．技术风险出现。当事人努力履行，但现有水平无法达到，有足够技术难度，同行专家认定为合理失败；

4．当事人一方延迟履行合同主要义务，经催告后在合理期限内仍未履行。

第二十四条 双方因履行本合同而发生的争议，应协商、调解解决。协商、调解不成的，确定按以下第 2 种方式处理：

1．提交 / 仲裁委员会仲裁；

2．依法向甲方所在地人民法院起诉。

第二十五条 本合同一式 6 份，具有同等法律效力。甲方执 3 份，乙方执 3 份。

第二十六条 本合同经双方签字盖章后生效。

甲方：成都锦江电子系统工程有限公司（盖章）

法定代表人/委托代理人：苏纲 （签名）

2023 年 5 月 10 日

乙方：南京信息工程大学（盖章）

法定代表人/委托代理人：田伟 （签名）

2023 年 5 月 10 日

10

8. 某领域某智能应用构想和概念体系研究

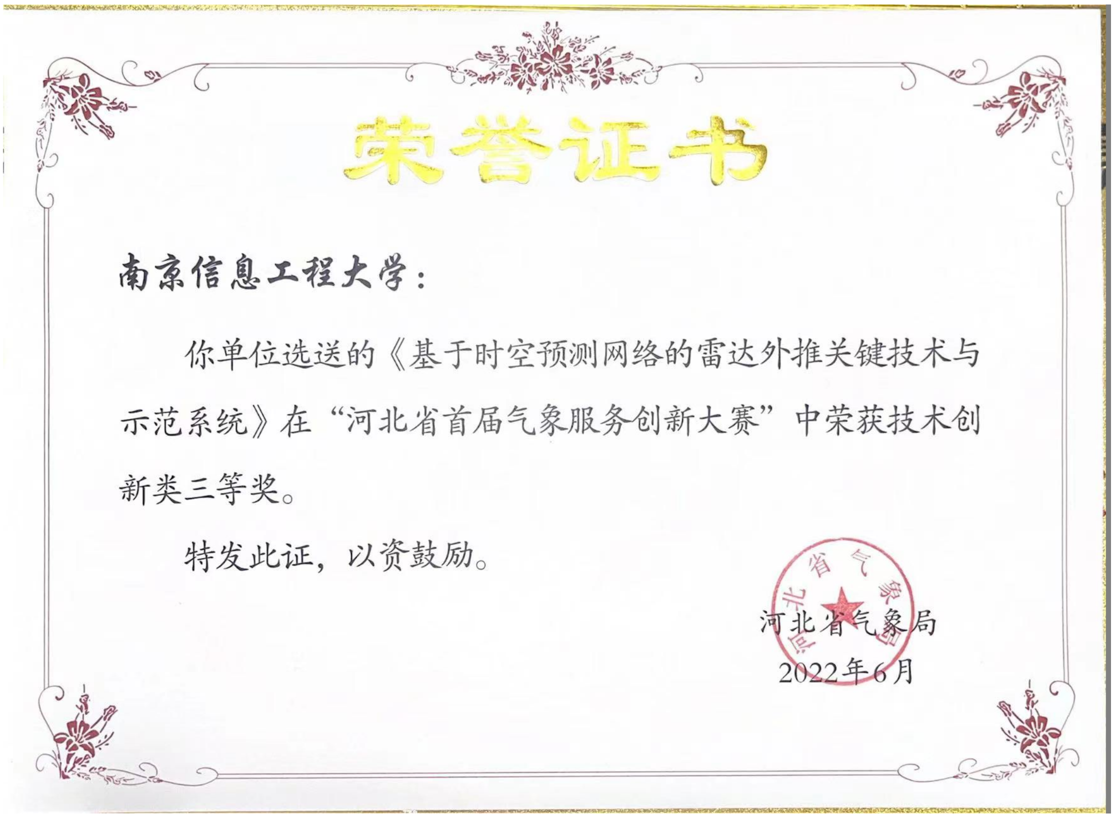
军委科技委基础加强计划重点研究项目第 1 课题，某领域某智能应用构想和概念体系研究，2020.11-2025.11; 在研 （合同保密）

9. 某卫星应用系统部分产品算法和辐射传输软件

军队采购网公开招标项目，某卫星应用系统部分产品算法和辐射传输软件，2020.06-2020.12，168.6 万元，主持，已结题（合同保密）

四、科研教学奖项:获奖证书

1、河北省首届气象服务创新大赛创新类三等奖



荣誉证书

南京信息工程大学：

你单位选送的《基于时空预测网络的雷达外推关键技术与示范系统》在“河北省首届气象服务创新大赛”中荣获技术创新类三等奖。

特发此证，以资鼓励。

河北省气象局

2022年6月

2. 中国发明协会发明创业奖成果二等奖

证书

国科奖社证字第0123号

为表彰发明创业奖成果奖获得者，特颁发此证书。

项目名称：基于大数据的灾害智能监测与风险预警关键技术

奖励等级：二等奖

完成单位：南京信息工程大学

南京国图信息产业有限公司

完 成 人：王国杰 苏布达 田 伟 王履华

路明月 沈 健

中国发明协会

二〇二二年十月

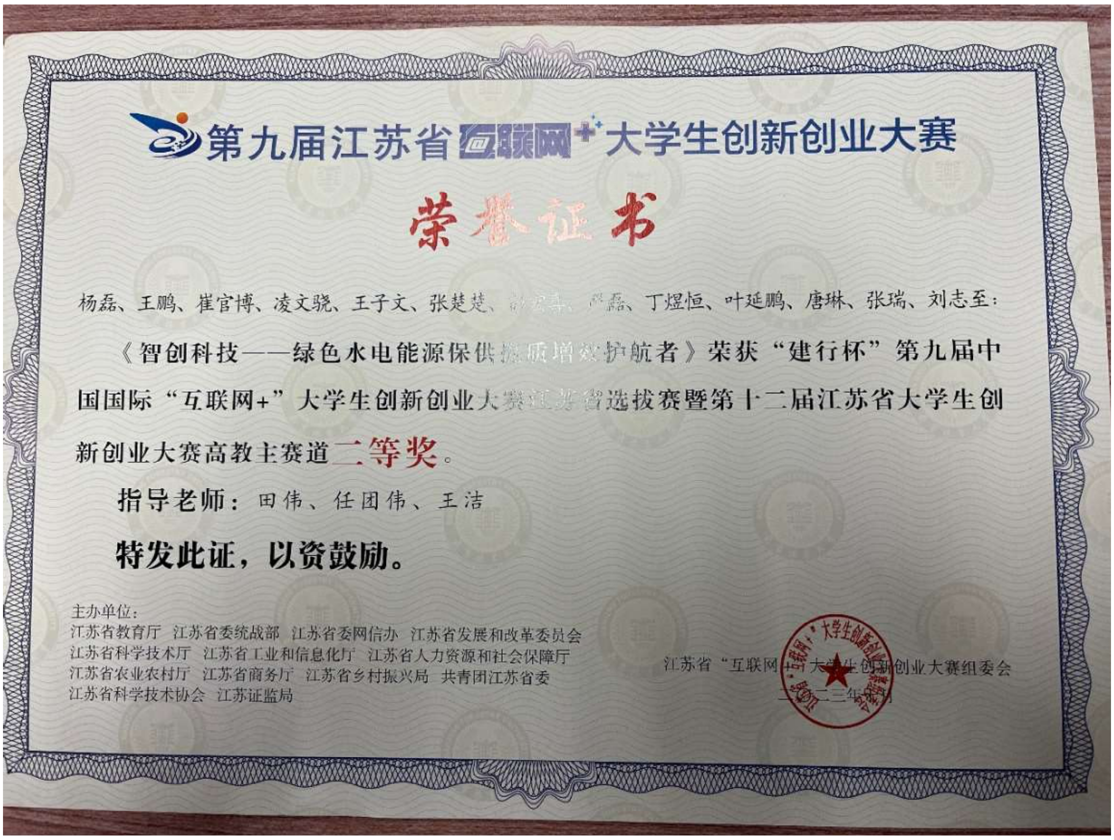
证书号：2022-CAICG-2-T08

3. 地理信息科技进步奖二等奖

4、指导学生获奖

指导本科生累计获奖数十余项，其中蓝桥杯获全国一等奖/优秀奖 6 项，互联网+省二等 1 项。

互联网+


第九届江苏省互联网+大学生创新创业大赛

荣誉证书

杨磊、王鹏、崔官博、凌文骁、王子文、张楚楚、[illegible]、[illegible]磊、丁煜恒、叶延鹏、唐琳、张瑞、刘志至：

《智创科技——绿色水电能源保供提质增效护航者》荣获“建行杯”第九届中国国际“互联网+”大学生创新创业大赛江苏省选拔赛暨第十二届江苏省大学生创新创业大赛高教主赛道二等奖。

指导老师：田伟、任团伟、王洁

特发此证，以资鼓励。

主办单位：
江苏省教育厅　江苏省委统战部　江苏省委网信办　江苏省发展和改革委员会
江苏省科学技术厅　江苏省工业和信息化厅　江苏省人力资源和社会保障厅
江苏省农业农村厅　江苏省商务厅　江苏省乡村振兴局　共青团江苏省委
江苏省科学技术协会　江苏证监局

江苏省“互联网+”大学生创新创业大赛组委会
二〇二三年[illegible]

蓝桥杯

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导胡振鹏荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛全国总决赛Web应用开发大学组优秀奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：211504032

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年6月2日

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导刘海涛荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛全国总决赛C/C++程序设计大学B组优秀奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：021596585

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年6月2日

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导胡振鹏荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛江苏赛区Web应用开发大学组一等奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：211502655

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年4月29日

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导顾润荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛江苏赛区C/C++程序设计大学B组一等奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：021565883

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年4月29日

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导刘海涛荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛江苏赛区C/C++程序设计大学B组一等奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：021565862

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年4月29日

蓝桥杯大赛

获奖证书

南京信息工程大学田伟：

指导廉宸荣获第十五届蓝桥杯全国软件和信息技术专业人才大赛江苏赛区C/C++程序设计大学B组一等奖，被评为优秀指导教师。

特发此证，以资鼓励。

证书编号：021565859

证件号码：320826198009251016

工业和信息化部
人才交流中心

蓝桥杯大赛组委会

2024年4月29日

五、独立培养硕士或协助完整指导博士生的学位论文封面

分类号：______________　　　　　　单位代码：10300

密　级：______________　　　　　　学　　号：20201221066

南京信息工程大学

硕 士 学 位 论 文

论文题目：基于多任务卷积神经网络的热带气旋强度和尺度估计研究

申请人姓名：周鑫鑫

指 导 教 师：田伟 副教授

学 科 名 称：软件工程

研 究 方 向：深度学习，热带气旋

培 养 学 院：软件学院

提 交 时 间：2023 年 6 月 4 日

二〇二三年六月

分类号：______________　　　　　　　　单位代码：10300

密　级：______________　　　　　　　　学　　号：20201221022

南京信息工程大学

硕 士 学 位 论 文

论文题目：基于深度学习融合环境场信息的热带气旋强度估计研究

申请人姓名：赖霖鸿

指 导 教 师：田　伟　副教授

学 科 名 称：软件工程

研 究 方 向：深度学习、热带气旋强度估计

培 养 学 院：软件学院

提 交 时 间：2023 年 6 月 3 日

二〇二三年六月

分类号：　　　　　　　　　　　　　　　　单位代码：10300

密　级：　　　　　　　　　　　　　　　　学　　号：20191221024

南京信息工程大学

硕 士 学 位 论 文

论文题目：基于时空预测网络和卷积神经网络的短临降水预测研究

申请人姓名：易　雷

指 导 教 师：田　伟　副教授

学 科 名 称：软件工程

研 究 方 向：深度学习、短临降水预测

培 养 学 院：计算机学院、软件学院、网络空间安全学院

提 交 时 间：2022 年 6 月 10 日

二〇二二年六月

分类号：______________ 单位代码：10300

密　级：______________ 学　号：20201249496

南京信息工程大学

硕士专业学位论文

论文题目：基于深度学习的数值天气预报降水产品订正方法研究

申请人姓名：	张敬国
指 导 教 师：	田伟副教授、何建军研究员
类 别 名 称：	电子信息
领 域 名 称：	软件工程
培 养 学 院：	软件学院
提 交 时 间：	2023 年 6 月 1 日

二〇二三年六月

分类号：＿＿＿＿＿＿ 单位代码：10300

密　级：＿＿＿＿＿＿ 学　号：20201249473

南京信息工程大学

硕士专业学位论文

论文题目：基于深度学习的气象环境下军事装备机动效能评估研究与实现

申请人姓名：	王瑾仪
指 导 教 师：	田　伟　副教授
类 别 名 称：	电子信息
领 域 名 称：	软件工程
培 养 学 院：	软件学院
提 交 时 间：	2023 年 6 月 3 日

二〇二三年六月

分类号：________　　　　　　　　　　　　　　单位代码：10300

密　级：________　　　　　　　　　　　　　　学　号：20211220054

硕士学位论文

论文题目：基于多任务和自适应权重学习的热带气旋强度短期预测研究

申请人姓名：宋萍

指导教师：田伟 教授

学科名称：计算机科学与技术

研究方向：深度学习、热带气旋

培养学院：计算机学院、网络空间安全学院

提交时间：2024年6月3日

二〇二四年六月

分类号：＿＿＿＿＿＿　　　　　　　　　　　　　单位代码：10300

密　级：＿＿＿＿＿＿　　　　　　　　　　　　　学　　号：20201249419

南京信息工程大学

硕士专业学位论文

论文题目：基于卷积神经网络的短临降水预报系统研究与应用

申请人姓名：刘欢欢

指 导 教 师：田　伟　副教授

类 别 名 称：电子信息

领 域 名 称：计算机技术

培 养 学 院：计算机学院、网络空间安全学院

提 交 时 间：2023 年 6 月 4 日

二〇二三年六月

分类号：______________ 单位代码：10300

密　级：______________ 学　号：20201249437

南京信息工程大学

硕士专业学位论文

论文题目：基于图卷积神经网络的时序知识图谱推理算法研究及应用

申请人姓名：杨琴琴

指导教师：田伟 张骁雄

类别名称：电子信息

领域名称：计算机技术

培养学院：计算机学院、网络空间安全学院

提交时间：2023年6月4日

二〇二三年六月