专业外语
Professional English in Architecture

李韵琴
南昌大学建筑与设计学院
2023年3月28日

南昌大学 NanChang University

LAB Intelligent Urban Collective Environment Lab

《专业外语》教学大纲

1. 课程概论 (2月26日)
2. 建筑类专业词汇与口语表达技巧(2月29日)
3. 视听训练及研讨(3月4日)
4. 视听训练及研讨(3月7日)
5. 视听训练及研讨(3月11日)
6. 互动作业汇报(3月14日)
7. 互动作业汇报(3月18日)
8. 互动作业汇报(3月21日)
9. 视听训练及研讨(3月25日)
10. 专业文献精读(3月28日)
11. 科技论文写作技巧(4月1日)
12. 期末考试(4月4日)

专业文献精读

第十讲

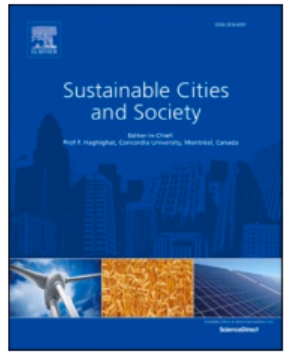
科技论文精读

Sustainable Cities and Society 86 (2022) 104140

Contents lists available at ScienceDirect

Sustainable Cities and Society

journal homepage: www.elsevier.com/locate/scs



Check for updates

Measuring visual walkability perception using panoramic street view images, virtual reality, and deep learning

Yunqin Li, Nobuyoshi Yabuki *, Tomohiro Fukuda

Division of Sustainable Energy and Environmental Engineering, Graduate School of Engineering, Osaka University, Japan

南昌大学 NanChang University

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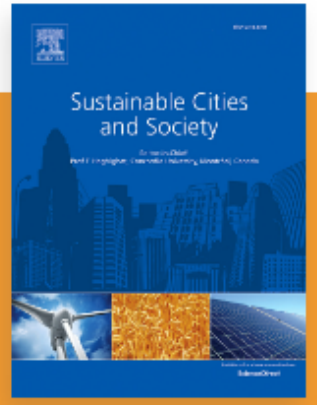
About the journal

- *Sustainable Cities and Society (SCS)* is an international journal focusing on fundamental and applied research aimed at designing, understanding, and promoting **environmentally** sustainable and **socially** resilient **cities**.



Sustainable Cities and Society

Supports *open access*

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3.8 weeks
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10%
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About the journal

1. **Smart** cities and **resilient** environments;
2. Alternative/clean **energy** sources, energy distribution, distributed energy generation, and energy demand reduction/management;
3. Monitoring and improving **air quality** in built environment and cities (e.g., healthy built environment and air quality management);
4. **Energy efficient, low/zero carbon**, and **green** buildings/communities;
5. **Climate change** mitigation and adaptation in urban environments;
6. **Green** infrastructure and **BMPs**;
7. Environmental **Footprint** accounting and management;
8. Urban **agriculture** and forestry;
9. **ICT, smart grid** and intelligent infrastructure;
10. Urban **design/planning**, regulations, legislation, certification, economics, and policy;
11. **Social** aspects, impacts and resiliency of cities;
12. **Behavior** monitoring, analysis and change within urban communities;
13. **Health** monitoring and improvement;
14. **Nexus** issues related to sustainable cities and societies;
15. **Smart city** governance;
16. **Decision Support Systems** for trade-off and uncertainty analysis for improved management of cities and society;
17. **Big data, machine learning, and artificial intelligence** applications and case studies;
18. **Critical infrastructure protection**, including security, privacy, forensics, and reliability issues of cyber-physical systems.
19. **Water footprint** reduction and urban water distribution, harvesting, treatment, reuse and management;
20. **Waste** reduction and recycling;
21. **Wastewater** collection, treatment and recycling;
22. Smart, clean and healthy **transportation** systems and infrastructure;

2022年期刊分区表升级版

2022年12月21日发布

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Review: 否

大类及分区

工程技术 1 区 Top

小类及分区

GREEN & SUSTAINABLE SCIENCE & TECHNOLOGY 绿色可持续发展技术 1 区

ENERGY & FUELS 能源与燃料 2 区

CONSTRUCTION & BUILDING TECHNOLOGY 结构与建筑技术 1 区

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ICE LAB Intelligent Urban Collective Environment Lab

Words and Phrases

- Panoramic 全景的
- Panorama 全景
- Semantic segmentation 语义分割
- Deep learning 深度学习
- Interpretable deep learning 可解释深度学习
- Built environment 建成环境
- Pedestrian 行人
- Accessibility 可达性
- Feasibility 可行性
- stepwise regression 逐步回归

List of abbreviations

Abbreviation	Meaning	
CNN	Convolutional Neural Networks	卷积神经网络
DCNN	Deep Convolutional Neural Networks	深度卷积神经网络
GIS	Geographical Information System	地理信息系统
MOT	Mutiple Object Tracking	多目标跟踪
POI	Point of Interest	兴趣点
SVI	Street View Image	街景图片
VWP	Visual Walkability Perception	视觉步行性感知
VWPCL	VWP classification deep multitask learning	VWP分类深度多任务学习
VR	Virtual Reality	虚拟现实
VRVWPR	VR Visual Walkability Perceptual Ratings	VR视觉步行能力的感知评分
Grad-CAM	gradient-weighted class activation mapping	梯度加权类激活图谱

Title

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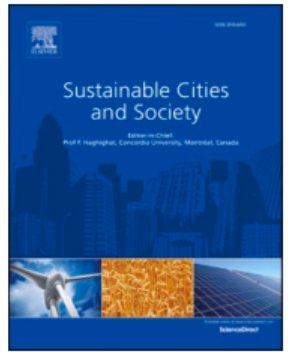

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Title

Review Articles

Review article ○ Abstract only

Algorithmic urban planning for smart and sustainable development: Systematic review of the literature

Tim Heinrich Son, Zack Weedon, Tan Yigitcanlar, Thomas Sanchez, ... Rashid Mehmood
Article 104562

Article preview

Regular Articles

Research article ○ Abstract only

Investigating the impact of urban microclimate on building thermal performance: A case study of dense urban areas in Hong Kong

Sheng Liu, Yu Ting Kwok, Chao Ren
Article 104509

Article preview

Title

Research article ○ Abstract only

The relationship between resource utilization and high-quality development in the context of carbon neutrality: Measurement, assessment and identification

Zhizhuo Zhang, Qiting Zuo, Donglin Li, Qingsong Wu, Junxia Ma
Article 104551

Article preview

Research article ○ Abstract only

CFD simulations of instantaneously released liquefied gas in urban areas: A case study of LPG tank truck accident in Wenling, China

Shan Lyu, Shuhao Zhang, Xiaomei Huang, Shini Peng, ... Qi Qi
Article 104550

Article preview

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Title

Research article ○ Abstract only

Predicting the ammonia nitrogen of wastewater treatment plant influent via integrated model based on rolling decomposition method and deep learning algorithm

Kefen Yan, Chaolin Li, Ruobin Zhao, Yituo Zhang, ... Wenhui Wang

Article 104541

Article preview

Research article ○ Abstract only

An unsupervised method to exploit low-resolution water meter data for detecting end-users with abnormal consumption: Employing the DBSCAN and time series complexity

Hani Ghamkhar, Mohammadreza Jalili Ghazizadeh, Seyed Hossein Mohajeri, Iman Moslehi, Ehsan Yousefi-Khoshqalb

Article 104516

Article preview

Abstract

A B S T R A C T

Measuring perceptions of visual walkability in urban streets and exploring the associations between the visual features of the street built environment that make walking attractive to humans are both theoretically and practically important. Previous studies have used either environmental audits and subjective evaluations that have limitations in terms of cost, time, and measurement scale, or computer-aided audits based on natural street view images (SVIs) but with gaps in real perception. In this study, a virtual reality panoramic image-based deep learning framework is proposed for measuring visual walkability perception (VWP) and then quantifying and visualizing the contributing visual features. A VWP classification deep multitask learning (VWPCL) model was first developed and trained on human ratings of panoramic SVIs in virtual reality to predict VWP in six categories. Second, a regression model was used to determine the degree of correlation of various objects with one of the six VWP categories based on semantic segmentation. Furthermore, an interpretable deep learning model was used to assist in identifying and visualizing elements that contribute to VWP. The experiment validated the accuracy of the VWPCL model for predicting VWP. The results represent a further step in understanding the interplay of VWP and street-level semantics and features.

Abstract

- Measuring perceptions of visual walkability in urban streets and exploring the associations between the visual features of the street built environment that make walking attractive to humans are both theoretically and practically important.
- 衡量城市街道视觉步行性的感知，探索街道建筑环境的视觉特征之间的关联，使步行对人类产生吸引力，在理论上和实践上都很重要。

Abstract

- Previous studies have used either environmental audits and subjective evaluations that have limitations in terms of cost, time, and measurement scale, or computer-aided audits based on natural street view images (SVIs) but with gaps in real perception.
- 以前的研究要么使用环境审计和主观评价，这些评价在成本、时间和测量规模方面都有局限性，要么使用基于自然街景图像（SVI）的计算机辅助审计，但在真实感知方面存在差距。

Abstract

- In this study, a virtual reality panoramic image-based deep learning framework is proposed for measuring visual walkability perception (VWP) and then quantifying and visualizing the contributing visual features.
- 在这项研究中，我们提出了一个基于虚拟现实全景图像的深度学习框架，用于测量视觉步行感知（VWP），然后量化和可视化贡献的视觉特征。

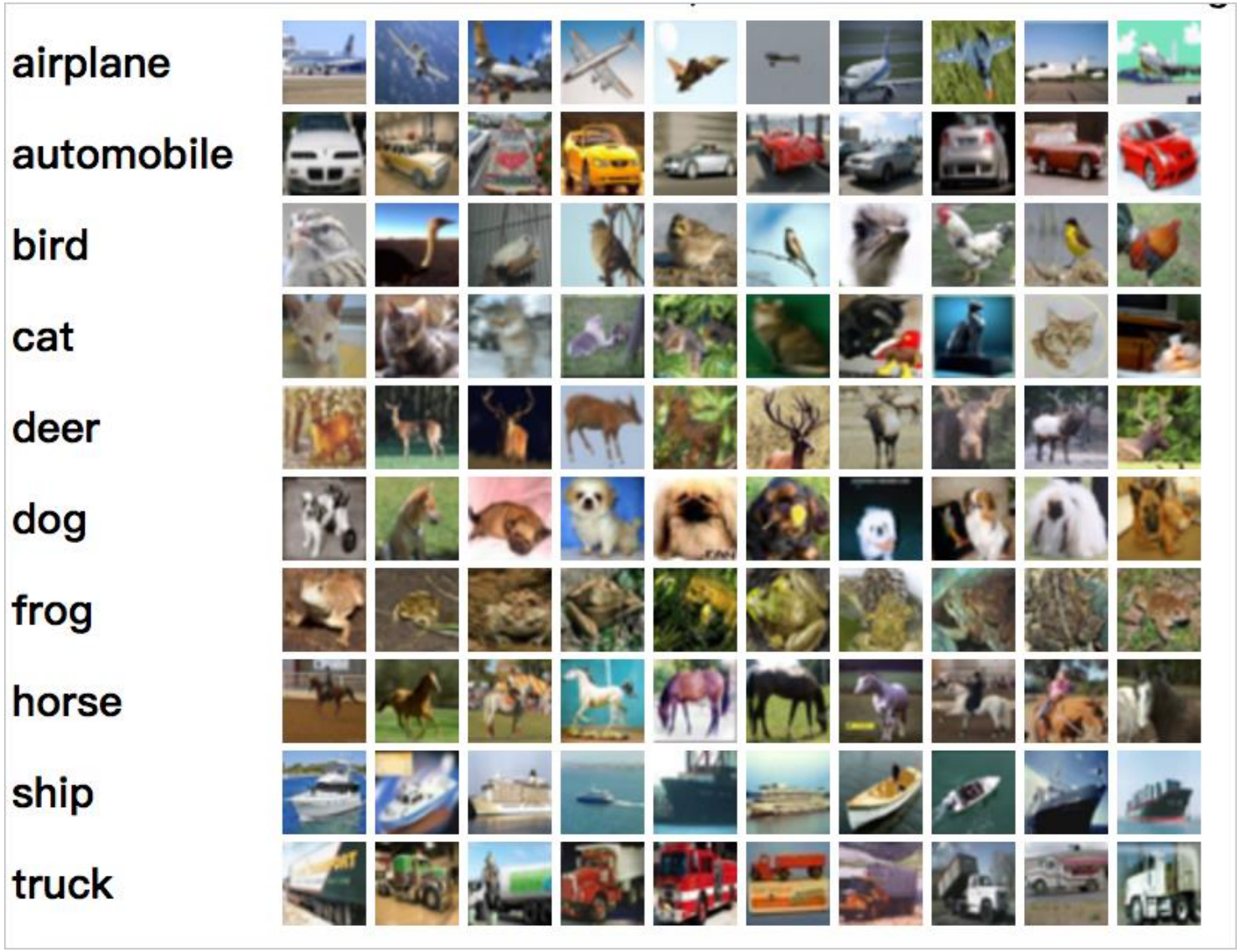
Abstract

- A VWP classification deep multitask learning (VWPCL) model was first developed and trained on human ratings of panoramic SVIs in virtual reality to predict VWP in six categories. Second, a regression model was used to determine the degree of correlation of various objects with one of the six VWP categories based on semantic segmentation. Furthermore, an interpretable deep learning model was used to assist in identifying and visualizing elements that contribute to VWP.
- 首先开发了一个VWP分类深度多任务学习（VWPCL）模型，并对人类在虚拟现实中对全景SVI的评分进行了训练，以预测六个类别的VWP。其次，在语义分割的基础上，使用回归模型来确定各种物体与六个VWP类别之一的相关程度。此外，一个可解释的深度学习模型被用来协助识别和可视化有助于VWP的元素。

Abstract

- The experiment validated the accuracy of the VWPCL model for predicting VWP. The results represent a further step in understanding the interplay of VWP and street-level semantics and features.
- 该实验验证了VWPCL模型预测VWP的准确性。这些结果代表了在理解VWP和街道层面的语义和特征的相互作用方面的进一步进展。

图像分类 image classification



图像分类 image classification

- **Evaluation of perceived Walkability of Urban Streets (walking willingness scoring)**

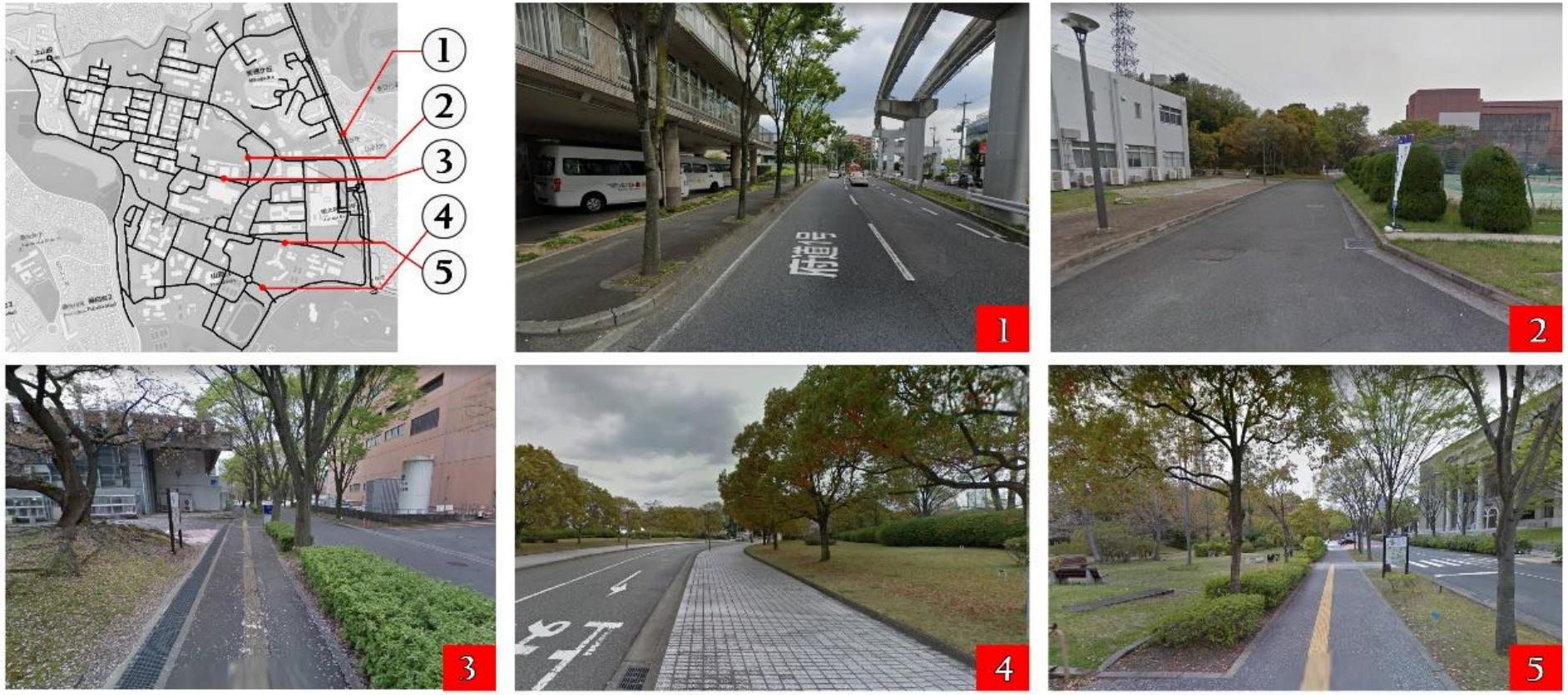


Figure Street-view images with walking willingness scores ranging from 1 to 5.

语义分割 semantic segmentation

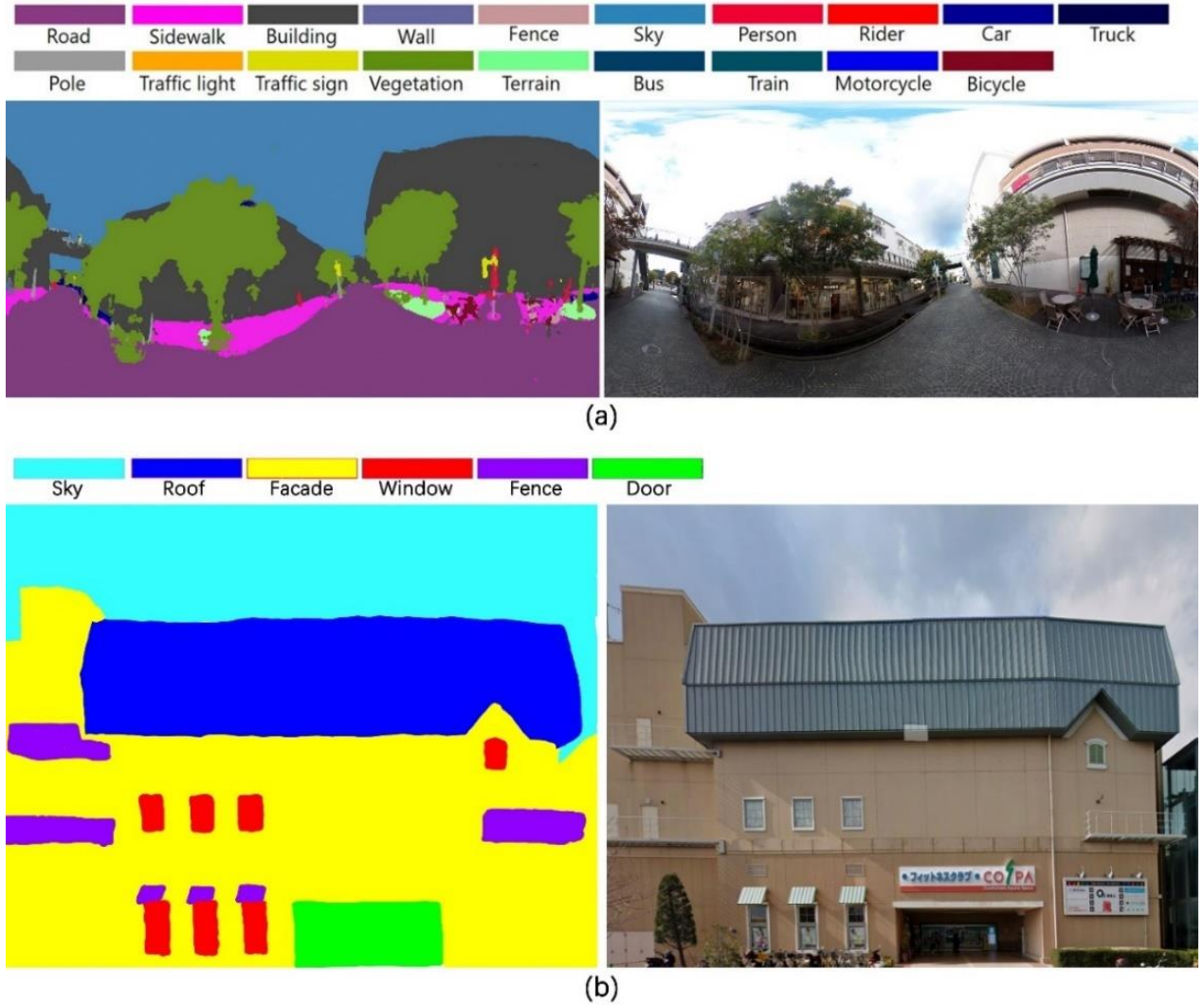


Figure Segmentation testing samples for (a) Deeplab-v3+ and (b) WEEK 3-Facade parsing

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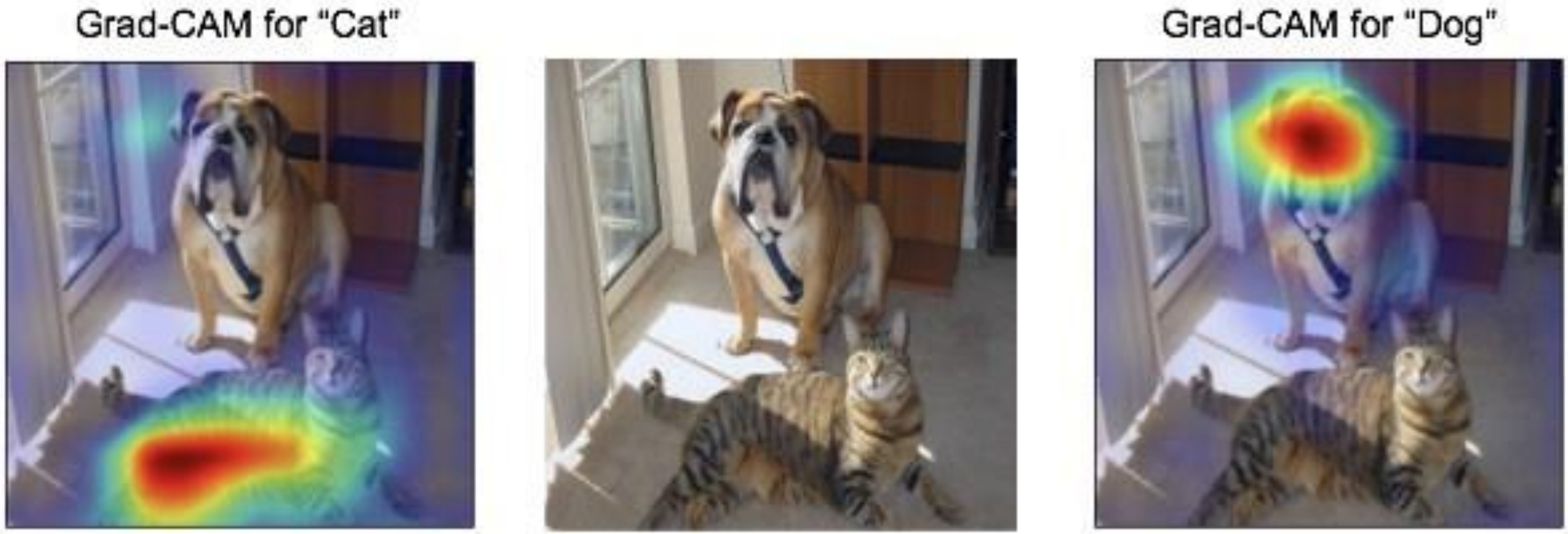
可解释人工智能 interpretable artificial intelligence



可解释人工智能 interpretable artificial intelligence

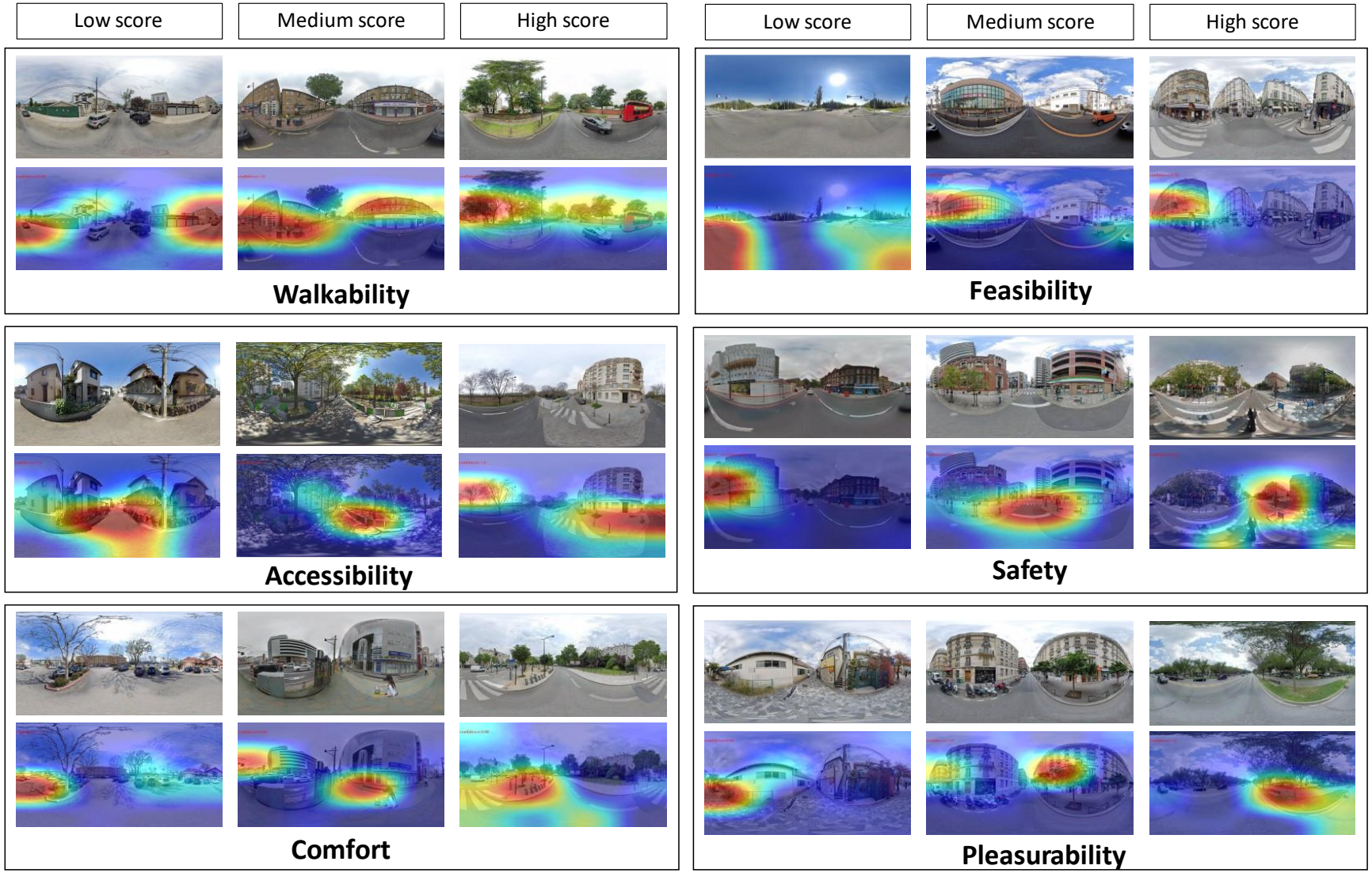


Figure Examples of Grad-CAM results for six-category VWP classification.

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Highlights & Keywords

ARTICLE INFO

Keywords:
Visual walkability perception (VWP)
Panoramic street view images
Virtual reality
Deep learning
Built environment

Highlights

- Six categories of visual walkability perception (VWP) were proposed.
- VWP was measured with VR panoramic-based deep learning framework.
- A VWP classification deep multitask learning model was developed.
- Stepwise regression analysis identified contributing visual elements.
- VWP was interpreted with gradient-weighted class activation mapping.

Headings

- **文章结构**

文章分为几部分?

每部分什么功能?

Headings

- 1 Introduction
- 2 Related work
  - 2.1 Visual walkability perception
  - 2.2 Panoramic SVIs and virtual-reality-based visual perception
  - 2.3 DCNN-based deep learning methods using SVIs to measure and interpret VWP
- 3 Materials and method
  - 3.1 Framework
  - 3.2 VR panoramic SVI-based and VRVWPR dataset
  - 3.3 VWP evaluation and prediction
  - 3.4 Interpreting VWP
  - 3.4.1 Correlation analysis between the object ratio of SVIs and VWP scores
  - 3.4.2 Interpretable deep learning for VWP results
  - 3.5 Method verification

Headings

- 4 Experiment and results
  - 4.1 VWP evaluation and prediction results
  - 4.2 Results of VWP interpretation
  - 4.2.1 Factor identification results of correlation analysis
  - 4.2.2 Interpretable results for VWP using Grad-CAM
  - 4.3 Method verification results
  - 4.3.1 VWP classification verification based on on-site auditing
  - 4.3.2 Grad-CAM verification: questionnaires for identifying contributing objects
- 5 Discussion
- 6 Conclusion

Manuscript Structure

Title

Abstract

1. **Introduction**

(Literature review)

2. **Methods**

(Experiments)

3. **Results**

4. **Discussion**

5. **Conclusion**

References

Manuscript Structure

- **手稿结构和内容**- 除了短的 Perspective Essays 和 Comments，作者应该使用这种数字结构在手稿中包含不同的部分，最多三个级别的副标题：1.、1.1.、1.1.1.、2 等。 大多数手稿研究报告应遵循标准结构和内容：
- **介绍**- 描述研究问题的性质和背景、其重要性和新颖性，以及解决该问题将如何促进您研究主题的科学和实践的进步。提供对与您的主题相关的主要文献的翔实、简明的评论，解决当前的知识状态和知识差距。参考关键经典和最新资源，展示您对文献的掌握，强调同行评审的国际研究期刊和书籍。无论您的工作是描述性的还是旨在检验假设，您的介绍都应充分说明问题并具体说明研究解决的问题或目标。
- **方法**- 如果您的研究具有地理焦点，请根据位置、比例和其他基本信息描述景观环境的性质，包括地图和/或背景照片（视情况而定）。提供足够详细的方法，以便读者可以在研究设计、抽样和数据收集、统计能力和精度、统计分析和其他程序方面评估您工作的可信度和严谨性。除了常见的统计测试和程序外，您的方法中在研究文献中具有优先权的步骤应该被充分引用。

Manuscript Structure

- **结果**- 以清晰简洁的方式描述您的发现，有效且经济地使用表格和数字。非必要数据应移至附录或作为在线补充材料提供。对统计检验和其他分析提供足够的解释，以便感兴趣的研究人员和从业人员的广泛、多学科受众能够理解要点。
- **讨论**- 反思你的发现本身以及与其他国际研究的关系。在不过度概括的情况下，推测您的发现如何适用于其他地方和情况。讨论工作的优点和缺点，以及如何在未来的研究中改进或扩展。酌情讨论您的工作对景观设计、规划、管理和/或政策的影响。
- **结论**- 总结您论文的要点，突出您希望人们记住您的工作的主要发现和影响。