LECTURE SUMMARY

Tools From Practice: Data Analytics for Evidence-based urban planning:

BEYOND THE FRAME: USING COMPUTER VISION TO UNLOCK THE POTENTIAL OF VIDEO DATA

EXPECTED LEARNING OUTCOMES

- Define Computer Vision and understand its core concepts and applications.
- Gain an overview of the workflow involved in the field of Computer Vision, from data collection to post-processing.
- Recognize the importance and requirements of data collection in Computer Vision.
- Explore open source datasets and understand their significance in Computer Vision research.
- Learn the principles and techniques of image and video processing as a critical component of data pre-processing.
- Understand the different types of algorithms used in Computer Vision and their respective applications.
- Learn how to effectively reduce and manage stored data in the post-processing stage.
- Analyze a real case scenario involving Urban Mapping, including the workflow, application, and the development and usage of tools in this context.
- Conclude the lecture by drawing lessons from the lecture's content, focusing on the concepts and techniques related to object detection and tracking in Computer Vision.

SUMMARY OF THE LECTURE

The lecture titled "BEYOND THE FRAME: USING COMPUTER VISION TO UNLOCK THE POTENTIAL OF VIDEO DATA" explores the application of computer vision as a tool in evidence-based urban planning. The lecture provides a comprehensive overview of various aspects of computer vision and its role in urban analytics.
The introduction includes a foundational understanding of Computer Vision, defining its

key concepts and outlining its significance in the realm of evidence-based urban planning.
Subsequently, the lecture presents a Workflow Overview, providing a step-by-step guide to how computer vision is integrated into the urban planning process. This holistic view helps students understand the seamless transition from data collection to actionable insights.
The importance of Data Collection is emphasized by highlighting the requirements and significance of gathering data for urban planning. This stage sets the foundation for evidence-based decision-making. Open source datasets are consequently explored as valuable resources for data collection, with an emphasis on their availability and utility in urban analytics.
The lecture proceeds to Data Pre-Processing, focusing on the critical tasks of image and video processing. These processes are integral in ensuring that raw data is ready for analysis, enhancing the quality and relevance of the collected data.
Different types of algorithms used in Computer Vision are introduced, allowing students to understand the diversity of tools available for image and video analysis. This knowledge provides a solid foundation for algorithm selection in various urban planning scenarios. Efficient Data Post-Processing is highlighted, concentrating on the reduction of stored data. Students learn how to manage and streamline data for better accessibility and usability in urban planning projects.
In a real case scenario involving Urban Mapping, students are presented with a practical example of the lecturer's concepts in action, with a direct reference to what was presented previously in the lecture: **Evidence-Based Design and Planning: Predicting effects of design and planning interventions -**
Urban Mapping: Sensing Public Spaces. This section delves into the workflow application and the development and usage of tools for urban mapping.
The lecture concludes with valuable lessons learned, particularly focusing on Object Detection and Tracking. Students gain insights into the practical implications of these techniques in urban planning and the potential they hold for informed decision-making.
In summary, the lecture equips students with a thorough understanding of Computer Vision and its application in evidence-based urban planning. Through a structured approach, students learn about data collection, processing, algorithm selection, and post-processing, culminating in a real-world case study. This knowledge allows future urban planners to leverage computer vision for more effective and informed urban development.

REFERENCES

InPlanEd

INTEGRATED PLANNING APPROACHES IN HIGHER EDUCATION: COLLABORATIVE EDUCATIONAL PROTOTYPE TOWARDS INTEGRATED APPROACHES IN THE PLANNING OF INCLUSIVE, PEOPLE-CENTRIC AND CLIMATE-RESILIENT CITIES

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CASE STUDY SUMMARY

Sensing Urban Spaces: The Case Study of Barcelona Superblock

Location: Barcelona, Spain
Date: 2021

SUMMARY DESCRIPTION

In recent years, novel data-driven instruments have emerged, revolutionizing spatial planning by providing innovative approaches to address urban challenges. These cutting-edge techniques leverage computer vision and machine learning algorithms to extract meaningful insights from image analytics. By analyzing non-sensible metrics, these data-driven methodologies aim to inform spatial transformations and estimate CO2 emissions in urban environments. This research presents a comprehensive methodology that encompasses data collection, processing, visualization, and evaluation to promote sustainable urban development.

Methodology:
Data Collection: To facilitate this data-driven approach, video recordings authorized and provided by the urban municipality are collected. These recordings capture the dynamic aspects of the urban environment and serve as valuable input for subsequent analysis.
Data Processing: Employing advanced computer vision and machine learning, algorithms analyze videos to extract key information like spatial dynamics and pedestrian behavior. Data Visualization: Processed data is presented cartographically, aiding historical analysis for understanding past urban strategies and guiding future planning decisions.
Comparative Evaluation: Object detection algorithms are used to identify the most accurate solution, calibrating the analysis process.
Urban Model Evolution: This data-driven approach reshapes urban models, promoting data-rooted city planning. Insights aid planners in creating sustainable strategies for healthier cities.
Conclusion: In conclusion, this data-driven approach to spatial planning, utilizing computer vision and machine learning algorithms, holds immense promise for the future of urban development. By leveraging historical evidence and contemporary data analysis techniques, stakeholders can make informed decisions that foster sustainable urban transformation and heightened environmental awareness. This methodology stands at the forefront of the quest for creating greener, more efficient, and resilient cities for future generations.

LINKS

https://noumena.io/en/works/sensing-public-spaces/