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# e - Proceedings

# IUGeT

## Proceeding for International Undergraduates Get Together 2024 (IUGeT 2024)

"Undergraduates' Digital Engagement Towards Global Ingenuity"

**2nd Edition**

Organiser :

**Department of Built Environment Studies and Technology, College of Built Environment, UiTM Perak Branch**

Co-organiser :

**INSPIRED 2024. Office of Research, Industrial Linkages, Community & Alumni (PJIMA), UiTM Perak Branch**

**Bauchemic (Malaysia) Sdn Bhd**

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# AUTOMATIC STREET UMBRELLAS FOR PUBLIC SPACES

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**Abstract**
In urban environments, comfort and usability of public spaces are crucial for enhancing livability and encouraging outdoor activities. However, adverse weather conditions often hinder these experiences. To address this challenge, this paper proposes the concept of automatic street umbrellas as a solution to provide instant shelter during rainfall or intense sunlight. These umbrellas are equipped with sensors to detect environmental factors such as rain or high UV levels, triggering their deployment. The design incorporates robust materials for durability and employs a smart system for efficient operation and maintenance. Additionally, the umbrellas can be integrated with smart city infrastructure, enabling remote monitoring and control. Through this innovation, cities can create more adaptable and comfortable outdoor environments, promoting social interaction and urban vitality.

**Keywords:** *Urban Comfort, Instant Shelter, Smart City Infrastructure, Automatic Deployment*

## 1. INTRODUCTION

Public spaces are vital hubs in cities, but bad weather often keeps people indoors. Automatic street umbrellas offer a solution. These high-tech umbrellas sense rain or strong sunlight and open up to keep people dry or shaded. They're like smart guardians of public spaces, making them more enjoyable whatever the weather. These umbrellas aren't just practical; they're also part of a vision for modern, adaptable cities. By blending technology with urban design, they make cities more comfortable and welcoming for everyone. In this paper, we'll explore how automatic street umbrellas work, their benefits, and how they could transform public spaces for the better

## 2. METHODOLOGY

We start by studying existing information about automatic street umbrellas, urban design, and smart cities. This helps us understand what's already known and what needs more investigation. Next, we come up with a plan for how the umbrellas should work in public spaces. We consider things like size, materials, and how they'll sense the weather and open up. We make smaller versions of the umbrellas to test our ideas. This lets us see if they actually work like we planned, especially in different weather conditions. We put our prototypes to the test in real public spaces and see how well they perform. We also ask people who might use them what they think. We look at how these umbrellas could fit in with other smart city technologies. This might include things like connecting to weather forecasts or using solar power. Finally, we figure out if these umbrellas are worth it. We consider how much they'll cost to make and maintain, and what benefits they'll bring to the people who use public spaces. By following these steps, we hope to learn more about whether automatic street umbrellas can make public spaces better in cities.

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## 3. RESULTS AND DISCUSSION

Our prototypes effectively responded to environmental cues, user feedback showed strong support for implementation, integration with smart infrastructure was feasible, and while initial costs were offset by long-term benefits, further research is needed for economic feasibility and scalability, suggesting automatic street umbrellas offer promise for enhancing urban comfort and usability pending refinement and long-term evaluation.

## 4. CONCLUSION

In conclusion, our study demonstrates the potential of automatic street umbrellas to significantly enhance the comfort and usability of public spaces in urban environments. Through effective response to environmental cues, integration with smart infrastructure, and strong user support, these umbrellas offer promise for improving urban livability. While further research is needed to address economic feasibility and scalability concerns, the findings suggest that automatic street umbrellas represent a viable solution for enhancing urban comfort and should be explored further for their potential to transform urban landscapes.

## 5. ACKNOWLEDGMENT

We extend our sincere appreciation to all group members who contributed to this research endeavor. Special thanks to Othman Lutfi, our leader, for their expert guidance, insightful feedback, and unwavering support throughout the project. Their expertise and dedication have been indispensable in shaping the direction of this study and ensuring its success. We are also grateful to our Sir Naim Mahyuddin whose assistance and encouragement have been invaluable.

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# "VERSABENCHPRO"

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**ABSTRACT:**
This project outlines the design and construction of a multi-functional folding bench that integrates a table, bench seating, and a mini roof, offering a versatile and space-efficient solution for outdoor environments. The bench is crafted from durable wooden planks, ensuring robustness and longevity. The innovative design features a foldable table that seamlessly transforms from the backrest of the bench, providing a convenient workspace or dining area when needed. Additionally, a mini roof, constructed from lightweight yet sturdy materials, offers shade and protection from the elements, enhancing the bench's usability in various weather conditions. This folding mechanism allows for easy storage and transport, making it ideal for small outdoor spaces or temporary setups. The construction process involves precise cutting and assembly of wood components, careful installation of hinges for the folding elements, and secure attachment of the roof. The final product is finished with an outdoor wood sealant or paint to withstand environmental exposure. This multi-functional bench is designed for gardens, patios, and other outdoor settings where flexibility, functionality, and aesthetic appeal are paramount.

## 1. INTRODUCTION

Outdoor furniture that maximizes space and functionality is highly desirable for modern living environments. This project introduces the concept and construction of a multi-functional folding bench that incorporates a table, bench seating, and a mini roof. This design aims to provide a versatile, space-efficient, and aesthetically pleasing solution for outdoor areas such as gardens, patios, and balconies. When not in use, the table can be folded down to save space and maintain a sleek appearance.

## 2. MATERIALS AND METHODS

| | |
|---|---|
|  | **Steel**: 2x4 and 2x6 steel for the frame and seating, and stainless steel for the table surface. |

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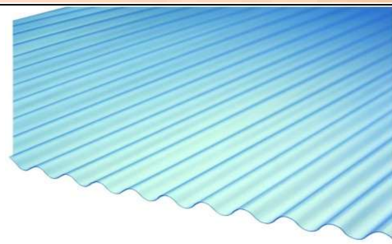
| | |
|---|---|
|  | **Fasteners**: Outdoor-grade screws, nails, and wood glue to ensure structural integrity. |
|  | **Roofing Material**: Corrugated plastic for the mini roof. |
|  | **Hardware**: Hinges for the foldable table mechanism, brackets for additional support, and outdoor steel sealant or paint for finishing. |

**The construction process involves several key steps:**

1. Planning and Measurement: Detailed drawings and precise measurements are crucial. Standard dimensions are considered, such as 18 inches for bench height and 30 inches for table height.
2. Cutting and Assembly: stainless steel is cut to size and assembled to form the bench frame, seat, and table. The table is attached to the backrest using sturdy hinges.
3. Roof Construction: The mini roof frame is built and attached to the bench structure, ensuring it is securely fastened and provides adequate coverage.
4. Finishing: All steel surfaces are sanded smooth and treated with an outdoor stainless steel or paint to protect against weathering.

## 3. RESULTS AND DISCUSSION

The final product is a multi-functional piece of outdoor furniture that combines utility, comfort, and aesthetic appeal. The folding mechanism of the table allows for easy transition between different uses, while the mini roof provides practical protection from sun and rain. This design is particularly beneficial for small outdoor spaces, offering flexibility without compromising on functionality. The use of durable materials and a sturdy construction approach ensures the bench's longevity. Additionally, the project demonstrates that such a multi-functional piece can be constructed with readily available materials and basic woodworking skills, making it accessible to a broad audience.

## 4. CONCLUSION

In conclusion, the multi-functional folding bench with an integrated table and mini roof represents a practical and innovative solution for enhancing outdoor living spaces. Its design maximizes functionality while maintaining a compact footprint, making it ideal for a variety of settings. This project not only provides a guide for creating versatile outdoor furniture but also inspires further innovations in space-efficient design. Future improvements could include incorporating adjustable roofing angles or integrating storage compartments within the bench structure.

## 5. ACKNOWLEDGMENT

First of all, we would like to thank our advisor, Sir Naim Bin Mahyuddin, who gave us the opportunity to share about our innovation in applying the environment, which made us hone and work hard in completing this project within the given time frame. with this opportunity we can also give inspiration to people out there about the innovation that has been created by a group of us. Once again, I would like to express my gratitude and appreciation to the members of the group who have cooperated in doing this project.

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