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PlastiCity Tree.
Parametric Installation
for Sustainable Campaign

Plasti(C)ity Tree

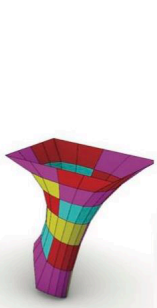
Architectural Installation as an Environmentally Friendly Campaign

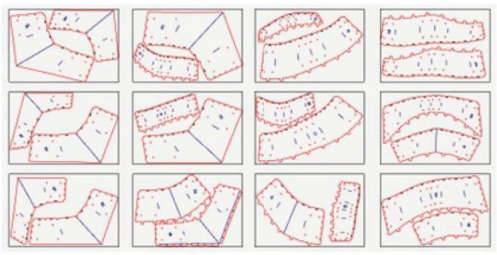
It was thought that between 5 and 13 million tonnes of plastic trash entered the world's oceans in 2010. Most of this trash came from impoverished countries and countries with high per capita consumption (Law, K.L. et al., 2020). Urbanowicz and Nyka (2012) found that architectural installations, which are both interactive media and art, have a big effect on the urban landscape. They improve public life, encourage people to get involved in their communities, and have a big impact on the identity and character of cities.

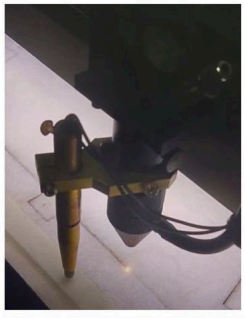
PlastiCity Tree uses this potential by turning environmental awareness into an art project and emotional experience using recyclable materials and parametric design as a design approach. The initiative was a collaborative effort involving Matra Studio as the main designer and idea developer for the project, which was a combined effort with LPPM Universitas Multimedia Nusantara (UMN) providing funds and volunteers. Mortier played a role by giving the equipment needed to turn plastic trash into LDPE sheets, while Wings Group provided the raw plastic waste materials.

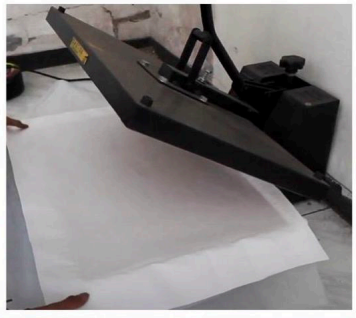
The shape of the installation was inspired by a tree, which stands for growth, renewal, and the strength of nature. It goes in a few different ways, which lets people see it from different angles and makes it stand out more. We used an experimental method that had a series of practical and iterative steps. These included 1) material preparation and 2) material experimentation. 3) 3D modelling 4) digital fabrication, translating the digital model into physical components by breaking it down into segments that matched the material limitations 5) Assembly: put all the parts together to make one piece of art. The first step of the process was to sort, clean, and dry the plastic waste that had been thrown away. After being cleaned, the polymers were stacked in ten layers and pressed to make sheets of low-density polyethylene (LDPE). Using the Kangaroo plugin in Grasshopper, the 3D modelling method utilised mesh relaxation methods. This procedure turned the structure into a natural, flowing form that represents mobility and flexibility. This computational technique shows how research and digital experimentation may be used in a meaningful way to create the installation's visual language. Digital manufacturing has made the transition from design to laser cutting far more efficient and accurate. The body was built utilising an interlocking system that cut down on the number of bolts used by more than 90% compared to the original plan. There are 12 main modules and 186 strips that link them. This modular design made logistics easier and allowed for some pre-assembly in the workshop before the final construction on site.

The Plasticity Tree was on display at the Jakarta Architecture Festival for three weeks, and over 5,000 people came to see it every day. The goal of the initiative was to raise awareness, spark conversation, and get people to act on climate change. It offers a new perspective on sustainability by showing creative and practical ways to reduce and extend the life of plastic waste. Our goal was to create a meaningful, emotional experience for both the volunteers who helped build it and the visitors who enjoy it. Plasticity Tree wants to enlighten and inspire people by showing how important it is to make our everyday routines more environmentally friendly.









Sustainable Installation – PlastiCity Tree

Ar. Rizki Tridamayanti Siregar, S.Pd., M.T.,Yasser Hafizs

Architectural installations are a means of conveying messages about awareness to be more environmentally conscious. The first exhibitions held by the organizers of architectural installation activities is the Jakarta Architecture Festival (JAF), an event that celebrates and promotes architecture in Jakarta, Indonesia. JAF is a platform for experts, industry players and architecture enthusiasts to share knowledge, ideas, latest trends and inspiration in architecture and design and publish them to the general public. The theme of JAF 2023 is Jakarta's "transition" as a city, implemented in the "Plasticity Tree" installation, using recycled plastic waste for environmental campaigns and sustainable education. The initial step in the installation process is to carry out preparations in the form of installation design studies, material manufacturing trials, mockup creation and testing, gathering volunteers, and technical finalization. After that the next process is production and then assembly and installation. Testing and evaluation is carried out from the initial process until the installation is built. Evaluation is also carried out on the final installation results as a reference for further installations in the future. The installation is well built and exhibited in the Main Lobby of Autograph Tower Thamrin 9 at the JAF 2023 event. The second exhibitions held by M Bloc Design Week 2024 with theme “upcycle material”, PlastiCity Tree exhibited from 26 September to 5 October 2024.

Sustainable Development Goal(s) Relevancy

Goal 11: Sustainable Cities and Communities
Goal 12: Responsible Consumption and Production
Goal 17: Partnerships for the Goals

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Short Biography

As a lecturer at Universitas Multimedia Nusantara an architect at PT. Matra Viridis Indonesia, Rizki have more than a decade of experience in creating innovative and sustainable solutions for various architectural and green building projects. Rizki has a Master of Science degree in Architecture from Institut Teknologi Bandung, where she focused on building technology and green building performance research. Rizki has contributed to multiple publications, certifications, and awards in the field of sustainable architecture and design, such as the 1st prize in the competition Bundaran Hang Nadim in BatamIndonesia and the 1st prize in the Kawasan Bundaran Maruga competition in South Tangerang -Indonesia. Rizki has a green building certified by Green Building Council Indonesia (GBCI) and Bangunan Gedung Hijau certified (BGH PUPR), and now involved in several IKN (Ibu Kota Nusantara) projects as a green building specialist. Rizki's goal is to collaborate with other professionals and stakeholders to create impactful and resilient design related to green buildings and communities.

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2nd Short Biography

Yasser Hafizs is an architect based in Jakarta. He began his career as an architect at SHAU Bandung and Büro Ole Scheeren - Beijing, and as a parametric specialist at Antistatics Architecture in Beijing. He currently serves as Principal at PT. Matra Viridis Indonesia (Matra Studio), an architecture studio that integrates computational technology to create innovative and sustainable designs and spaces. Driven by a passion for exploring the intersection of design and technology, Matra Studio is committed to delivering designs that is not only aesthetically compelling but also environmentally responsible. Among Matra Studio's achievements are first-place wins in the Hang Nadim Roundabout Design Competition and the Maruga Roundabout Design Competition.

Title

Sustainable Installation – PlastiCity Tree

Production Process Years

2023-2024

Publication Year

2024

Publication Details

Jakarta Architecture Festival 2023 (JAF 2023) event

Location : Autograph Tower, Thamrin Nine Building – Central Jakarta at Architecture Festival 2023 (JAF 2023) event
Date **:** 9-24 November 2024

Jakarta at M Bloc Design Week 2024 (MBDW 2024) event

Location : M Bloc Space – Jakarta at M Bloc Design Week 2024 event
Date **:** 26 Sept - 5 Oct 2024

Publication Media

Installation

Recognition

Media Exposure:
• https://plasticity.matrastudio.com/
• https://www.kosadata.com/read/transisi-jakarta-kota-globaldosen-umn-bikin-karya-instalasi-dari-plastik-daurulang?page=all
• https://www.radarbanten.co.id/2023/09/19/ini-keren-sampahplastik-jadi-karya-seni-nan-estetik/
• https://www.umn.ac.id/en/umn-architecture-creates-anartwork-from-200kg-of-waste/
• https://firstindonesiamagz.id/yayasan-wings-peduli-kerjasamastrategis-ubah-plastik-jadi-karya-instalasi-di-jakartaarchitecture-festival-2023/
• https://www.instagram.com/p/DAf9FsqTugr/?hl=en&img_index=1
• https://mblocdesignweek.id/m-bloc-space-jakarta/exhibitor/72/

Grants

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Additional

Collaborators:
Design: Matra Studio (www.matrastudio.com)
Funding: LPPM UMN (https://www.umn.ac.id/category/lppm/)
Lectures collaborators: M. Cahya Mulya Daulay,S.Sn., M.Ds., Rahmi Elsa Diana, S.T., M.T.
Tools for produce upcycle material: Mortier (https://mortier.id/)
Volunteers from UMN: Chaeri Abdillah, Gema Ibrahim Ahmada, Sangkakala P. Indo, Naya Kamila, Farah Artanti, Alicia Phannely, Ayu Nabilah, Shafira Ardhani, Pramudya Abimanyu, Donny Aditya Natanael, Rafa Naufal Adli, Nurul Izzah Saidah, Adetia Widiani, Helen Agustini, Theresia Winna,Christy Viani, Silvia Deborah Ulag, Wenzel Ferrel, Rapha Zakharia, Reno Alvero Soe, Rafiandy Bimo Nugroho, Bhagaskara Tri Atmojo
Raw material: Wings group