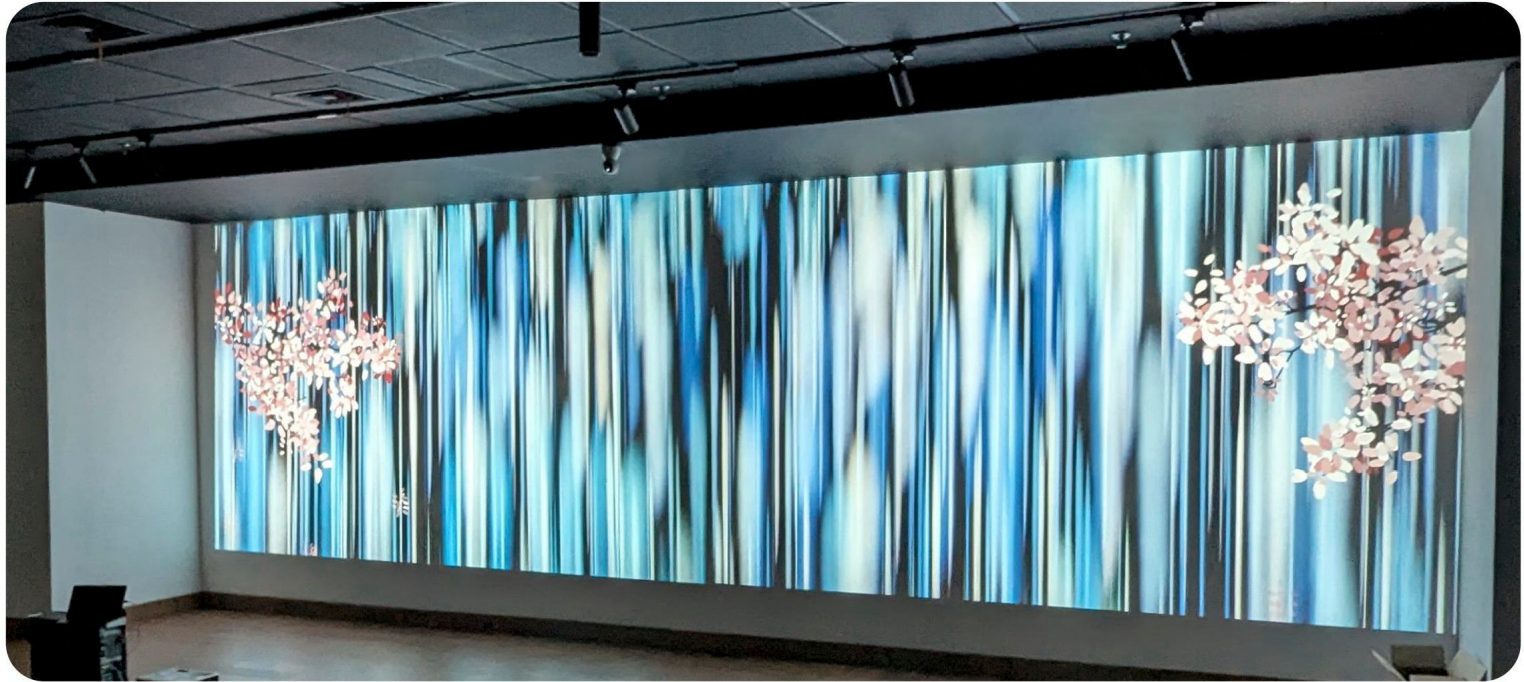




Design Phase

Testing & Prototype

Exhibit

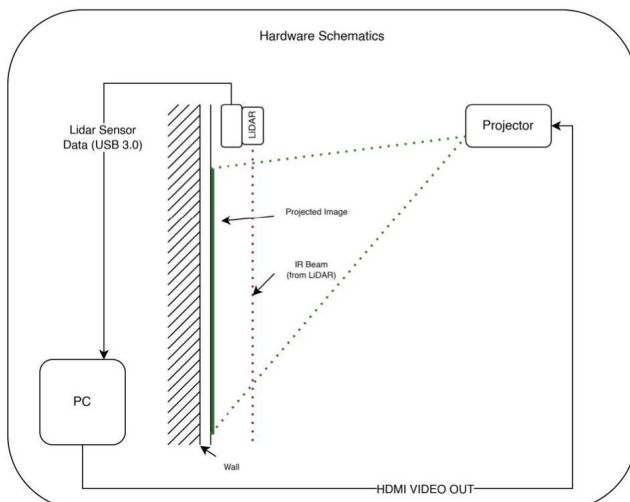
Exhibit



Hardware Requirements

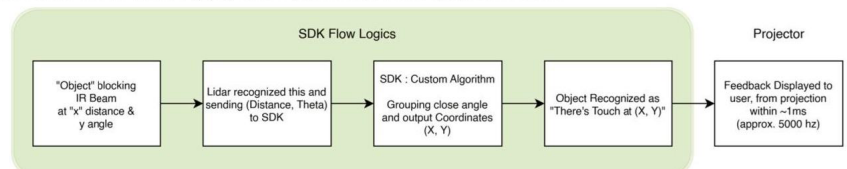
This setup require a Projector (any), flat wall, LiDAR system (recommended using RPLiDAR A2) and Computer.

Setup was shown below



How it works

LiDAR sensor receive power from PC, in response LiDAR sent data with format : distance & angle. This data was sent at 5000 hz over serial, then SDK converts all 720 data every seconds to determine which was "touch" and which to ignore. the result from this data is (X, Y) "touch" coordinates that displayed on screen.



Watch the video here



Interactive Waterfall Projection with LiDAR

Hadi Purnama, S.Ds., M.M.

This work presents an innovation in interactive design through a touch-controlled waterfall projection installation, utilizing RPLIDAR A2 and an InFocus IN136ST short-throw projector. Users intuitively interact by touching the projection wall, triggering a dynamic visual response of the waterfall splitting and virtual leaves falling. This interaction is enabled by a LiDAR sensor that accurately captures distance and degree data, which is then processed through a custom algorithm to convert the data into 2D vector coordinates. This algorithm allows a flat-plane projection to function as a touch screen without requiring physical modifications to its surface, a breakthrough in human-computer interaction. The result of this algorithm development is an SDK (Software Development Kit) actively used in the Immersive Design class at Universitas Multimedia Nusantara. This SDK is designed to simplify the development process of LiDAR-based interactive media applications, allowing students to focus on the creative and innovative aspects of their projects without being burdened by technical things. Thus, this SDK not only facilitates a more efficient development process but also encourages exploration and creation of innovative works in the field of art and interactive design. Beyond its unique and captivating aesthetic experience, this installation serves as a concrete demonstration of the potential applications of interactive technology in various contexts, including public installations such as interactive signage and interactive billboards. This work affirms how the integration of advanced technology and meticulous design can create meaningful, impactful experiences, and advance education and innovation in the realm of interactive design.

Sustainable Development Goal(s) Relevancy

Goal 4: Quality Education

References

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Short Biography

Hadi Purnama, S.Ds., M.M., serving as a team member and Interaction Design Specialist, is a lecturer in Visual Communication Design at Universitas Multimedia Nusantara, located in Tangerang, Indonesia. He holds both Bachelor's and Master's degrees from Universitas Multimedia Nusantara (UMN). Hadi possesses professional experience within the creative industry, including a tenure at a game studio where he held the positions of lead programmer and interaction specialist. His research interests primarily revolve around interaction design and User Experience. In addition to his role as a researcher, Hadi also contributes as an interaction specialist and programmer in the creation of this work.



Title

Interactive Waterfall Projection with LiDAR

Production Process Years

2023-2024

Publication Year

2024

Publication Details

This work was exhibited at the Nusakara Art and Design Centre and received visits from students and UMN partner campuses who were visiting. The early exhibition was held on January 15, 2025.

Publication Media

Projection Installation

Recognition

-

Grants

-

Additional

-