

# VisualPro: Preference Vs. Performance

## Research of the Complexity of Preference and Perfomance

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### Abstract

The content aims to compare preference and performance to conclude whether preference impacts performance. Ultimately, giving insight into User Usability and if a design based on individual preferences is an impactable approach. Experimentation of the development project involving a lightweight, visual scripting software, 'VisualPro', would help provide results within this study.

## Introduction

Research to complete the unfinished Jakob Nielson and Jonathon Levy's 'Measuring Usability: Preference vs. Performance' experiment to determine if preference impacts performance. The usage of the VisualPro project design and creation will support the investigation findings. Suppose it turns out to have a correlation or an indication of good User Usability. The results could change the design of products within projects in the future. It could save the cost and time of the development by listening to the target audience instead of fixing User Usability problems after deployment of the product.

The target audience of the project used for this study is the following members of the public:-

• **Experience Level:** Novice-Intermediate.

• **Expertise:**

- Software Engineering.
- Artificial Intelligence and Machine Learning.
- Web Development.
- Game Development.
- Science (Statistics/Data Analytics).

• **Environment Usage:**

- Home - VisualPro should work on any computer specification, excellent for remote work.
- Work - VisualPro suits a office environment.

“ For this experiment to work, two studies:-

• Gather details of how the target audience would like the Graphical User Interface and the type of functionality they would like to see within the project.

• Test the final product with the target audience.

After collecting the two studies, these are then compared with Fuzzy Expert logic to categorise each survey into three categories, 'Hard Usability', 'Moderate Usability' and 'Hard Usability'. Cross-referencing the two data results enables comparing Preference and Performance in a User Usability environment.

## Main Objectives

- Conduct two surveys involving the preference of the target audience to construct the end-product, VisualPro.
- To work out the weights applied to each category for the Fuzzy Expert logic transition.
- Analyse the two studies and find out the correlation between the two results and see if it forecasts any patterns of User Usability in general.

## Materials and Methods

To conduct the experiment, the VisualPro project will uses two methodologies to design and develop the project. These include the Quantitative, Descriptive and Fundamental research methodologies. The Quantitative research methodology would help construct the initial survey to have a clear indication of what User Usability features the target audience would like. Whereas the Descriptive and Fundamental research helps identify the User Usability diffulcities and identifies well-known novice struggles when learning how programming works and how to navigate the software. This would help constructing the survey data found in the final study. For the final survey to work with novices', two tutorial documents that covers both Object-Oriented Programming and Functional Program styles to teach the users different methods available within the software.

Fuzzy Expert logic will help identify the performance level of a User Usability category by three following categories, 'Hard Usability', 'Moderate Usability' and 'Easy Usability'. A conversion of the performance results from the final study using the Fuzzy Expert logic to identify the three categories. The same application of the previous method helps convert the preference results from the initial research. The following information could help indicate whether performance and preference contradict each other and may help determine if the initial study did help create a better UX and User Usability result.

**Performance Fuzzy Logic Setup:-**

**Mathematical Key:**

$\mathcal{U}$  = Usability Categories: 'Hard Usability', 'Moderate Usability' and 'Easy Usability'.

$\mathcal{P}$  = Performance Categories: 'Very Low', 'Low', 'High' and 'Very High'.

$\mathcal{VL}$  = Performance Category: 'Very Low (0%)'. -  $\mathcal{L}$  = 'Low (25%)'.

$\mathcal{H}$  = Performance Category: 'High (75%)'. -  $\mathcal{VH}$  = 'Very High (100%)'.

$\mathcal{R}$  = Responses with Performance Categories. -  $\mathcal{T}$  = An array of responses.

$$\mathcal{U} = \sum_{n=0}^3 \frac{100}{3} - (n = n + 5) \rightarrow |\mathcal{HU} \ \mathcal{MU} \ \mathcal{EU}|$$

$$\mathcal{P} = \frac{100}{4} \rightarrow |\mathcal{VL} \ \mathcal{L} \ \mathcal{H} \ \mathcal{VH}|$$

$$\mathcal{R}_P = |T_n|$$

$$\sum_{n=1}^{n < R_n} \mathcal{M}_{\setminus} = \frac{R_i}{R_T}$$

Essentially to work out the Performance figures, calculation of the code submissions within the survey to generate a percentage. Four statements measured by  $\mathcal{P}$ , 'The respondent followed the task correctly', 'The respondent seems to have followed the task correctly', 'The respondent seems to have followed the task incorrectly' and 'The respondent followed the task incorrectly' helps to determine the performance level. Each respondent's results are tallied up and positioned in the  $\mathcal{R}_P$  array, which provides a performance level of each respondent. Sum of  $\mathcal{P}$  of each  $\mathcal{R}$  element and then divided by the  $\mathcal{T}$  provides an average percentage. The  $\mathcal{U}$  identifies the Fuzzy Expert categories percentage with added weights. The weighing strategy should enable the analysis to be unbiased.

From the initial survey, a selection of two preference questions including Figure ?? - 'According to you, how should the features of the Graphical User Interface have to work?' and Figure ?? - 'How would you prefer to access the software?' helps work out the preference level. A calculation to sort out each categories with the responses and whether or not the preference is within the VisualPro design implementation. To filter the preference down, only the preferences within the VisualPro design implementation are taken into account. The mean of the preference of each category is then calculated and then inserted into the Fuzzy Expert logic. The preference and performance levels are then compared to determine the overall User Usability and analyse whether preference affects performance.

## Results

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Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015671	0.910
Treatment 3	0.0009271	0.296

Table 1: Table caption

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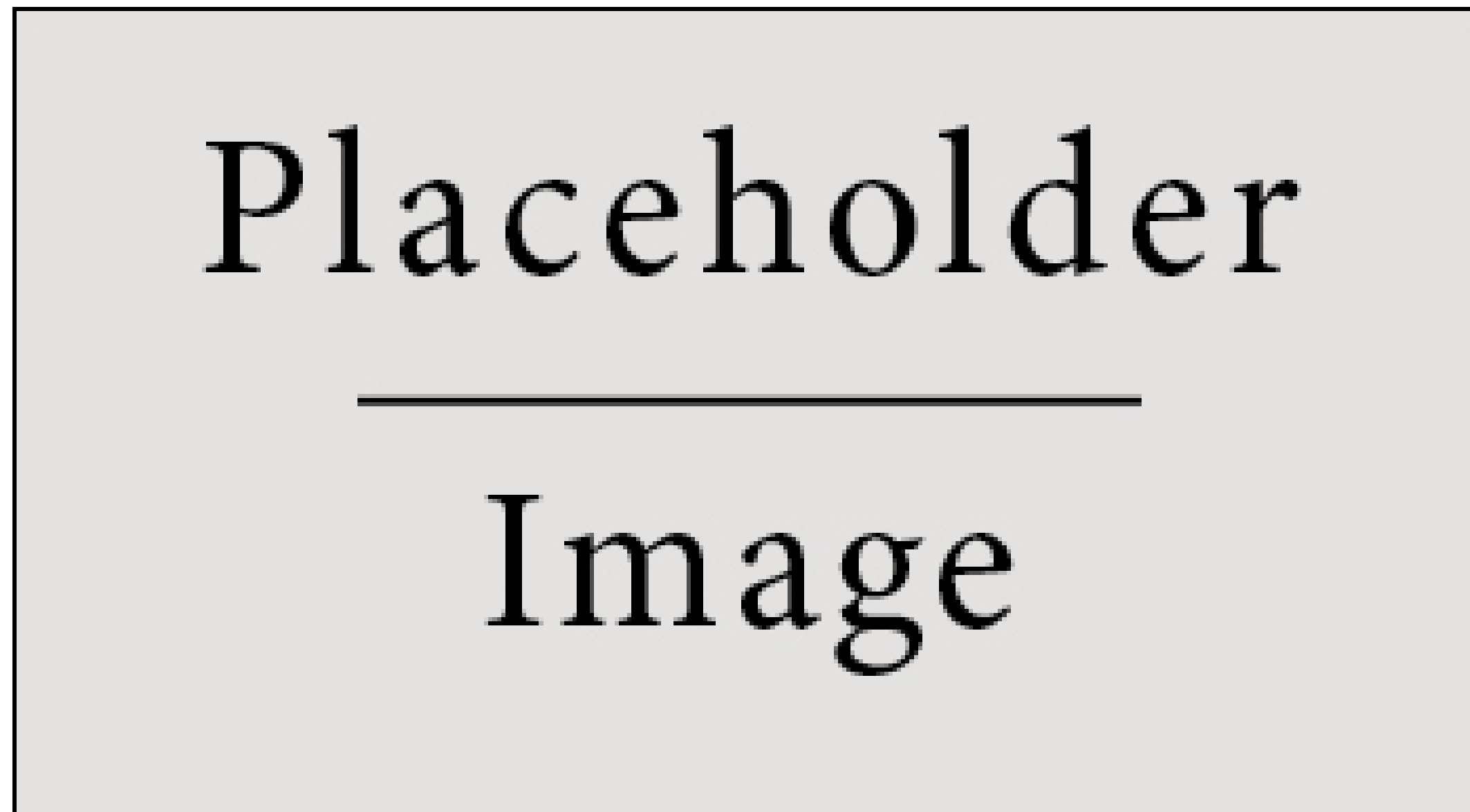


Figure 1: Figure caption

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Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table 2: Table caption

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Figure 2: Figure caption



## Conclusions

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## Forthcoming Research

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## References

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## Acknowledgements

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