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Call for Master Thesis at the Chair of Integrated Product Design (IPD)

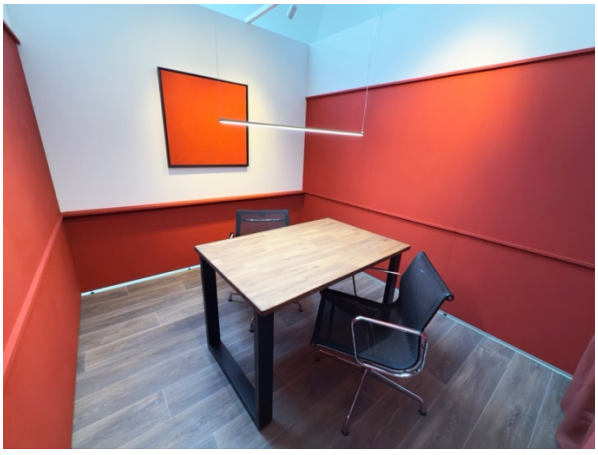
# THE SPATIAL DIMENSION OF HUMAN DECISION-MAKING II

## A biometric study to investigate the interior design's impact on decision quality

## Summary

Are you curious about how the spaces around us shape the way we think, feel, and make decisions? The relationship between physical space and decision-making (Morelli et al., 2022) is a fascinating and largely untapped area of research. In this thesis, you will investigate whether a purpose-built room designed to support focused decision-making (Schwartz et al., 2017) can improve decision quality and time and influence arousal, stress, and engagement during decision-making tasks compared to a standard, non-optimized environment. To explore this, you will run a standardized decision-making task, the NASA Moon Survival Task (Eddy, 1971), inside two rooms, one designed for decision-making and another for relaxed working. These two rooms already exist; see the images below. As part of your thesis, you will develop a research design for this study, including physiological measurements, behavioral observations, surveys, and performance data collection. The physiological measurements you can explore in this context include heart rate (HR), heart rate variability (HRV), and electrodermal activity (EDA) – well-established indicators of arousal, stress, and engagement. Further, you will recruit participants and run the study you developed. Finally, you will analyze the collected data – examine physiological signals, interpret survey results, and evaluate observational data – to draw meaningful conclusions about the impact of spatial design on decision-making. Ultimately, this thesis aims to contribute to a deeper understanding of how the intentional design of physical spaces can shape the decision-making experience by influencing physiological responses, decision quality, and decision time. If the outcome of your thesis allows, we will jointly publish the results in an academic design journal or conference proceedings.

**Keywords:** Decision-Making, Biometric Measurement Tools, Spatial Environment



Decsion-Making Room

Relaxed Working Room

## Prerequisites

In order to conduct this thesis at our chair, you need to bring an interest in decision-making, a solid understanding and experience with experimental research (if needed, this can be partly acquired through participation in the IPD Research Seminar), and some first experiences with or willingness to learn how to use biometric-measurement tools and other technology-based research tools. For this topic, we consider students from the following programs: Human Factors Engineering, Management, Consumer Science and Information Systems (students

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from other programs upon request). Please confirm with your study program if a thesis at our chair will be approved.

## Provided Resources

You will have access to our decision-making room for experimentation, a second comparison room (relaxing room), and our state-of-the-art research technologies for collecting biometric and observational data. The actual thesis will be in close collaboration with the chair. We offer 3 personal meetings throughout the thesis progress in a joint colloquium with other thesis candidates, plus on-demand consultations when needed.

## How to Apply

If you are interested in conducting this thesis at our chair, please send an email to **thesis.ipd@ed.tum.de** with reference line **"Master Thesis: The Spatial Dimension of Human Decision-Making II"**. Please state in your email your preferred starting date, your motivation for the topic, and attach your resume and some portfolio samples. Based on the provided materials we will invite you for a first meeting to discuss further.

## Key References

Eddy, J. (1971). Survival on the Moon… or "The Nasa Game." Science Activities: Classroom Projects and Curriculum Ideas, 5(1), 28–30. https://doi.org/10.1080/00368121.1971.10113270

Morelli, M., Casagrande, M., & Forte, G. (2022). Decision Making: A Theoretical Review. Integrative Psychological and Behavioral Science, 56(3), 609–629. https://doi.org/10.1007/s12124-021-09669-x

Schwartz, L. A., & Cuadros, L. (2017). The Effects of the Environment on Decision-Making. Journal of Finance Education, 43(2), 223–242.