There are 14 doctoral positions opening (1 per project). Scroll down to find out more. All projects involve at least two secondments within the consortium.

1. Dynamic updating of movement in haptic exploration of multifaceted objects

Description We will measure successive adaptation of haptic object exploration during varying sensory input in the perception of an objects shape and material properties. The goal is to understand how exploration strategies depend on perception of shape and materials, and to identify brain processes associated with exploration control.

Requires A **Masters degree** in psychology/cognitive sciences/ computer science or similar

Experience in:

- experimental methods (e.g. psychophysics)
- motion tracking/VR
- programming

Host JUSTUS-LIEBIG-UNIVERSITAT GIESSEN

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Knut Drewing
- Katja Doerschner

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2. Active exploration of iridescence and gloss

Description We will capture explorative behavior of human participants while they assess color and gloss of an object. Our goal is to understand the effects of viewing & lighting geometry and surface properties on exploration behavior and perception.

Requires A **Masters degree** in psychology/cognitive sciences/ computer science or similar

Experience in:

- experimental methods
- computer rendering
- programming

Host University of Oxford

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Hannah Smithson

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3. Dynamic changes in material appearance

Description We will capture and model changes in material appearance during exploratory movements, and aim to establish links between physical material parameters, dynamic changes in the visual information and material appearance.

Requires A **Masters degree** in computer science/ engineering/ mathematics or similar

Experience in:

- computational skills
- computer rendering
- programming

Host Czech Academy of Sciences

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Jiri Philips

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4. Exploratory hand and eye movements in the perception of special effects materials

Description We want to understand how exploratory interaction with an object modifies appearance special effects materials (e.g. glitter, pearlescence). We will identify dynamic image cues that correlate with perceptual characteristics and create standard scale for special effects material appearance for industry.

Requires A **Masters degree** in psychology/cognitive sciences/ computer science or similar

Experience in:

- experimental methods
- hand/body/eye tracking
- programming

Host JUSTUS-LIEBIG-UNIVERSITAT GIESSEN

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Roland Fleming
- Katja Doerschner

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5. The impact of object reactivity and task guidance on exploration strategies and curiosity

Description We will measure and model the effects of object reactivity and task guidance on exploration strategies and curiosity. We want to understand how a virtual object (3D replica or 2D mockup) reacting through touch manipulation affects exploration strategies and identify spatiotemporal visual patterns that are sought in the context of shape and/or material perception tasks - individually and collaboratively.

Requires A **Masters degree** in computer science/engineering or similar

Experience in:

- computer graphics
- VR
- programming

Host Inria

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Pascal Barla

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6. Computational models of multisensory integration during surface exploration

Description We will build mixed reality experiments, record and characterise exploratory hand movements during unconstrained surface exploration and model the integration of multisensory information & responses about object attributes.

Requires A **Masters degree** in psychology/ neuroscience/computer science/engineering/mathematics or similar

Experience in:

- experimental methods
- VR/XR
- programming/computational modeling

Host UNIVERSITY OF BIRMINGHAM

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Massimiliano di Luca

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7. Cultural modulation in the perception of natural material-exploration sounds represented through sound symbolism

Description We will identify natural material sounds that are fundamental to material recognition during haptic exploration. We will assess cultural modulation in the perception of natural material-exploration sounds represented through sound symbolism and account for the role of auditory information during exploration in a multisensory environment.

Requires A **Masters degree** in psychology/ neuroscience/computer science/engineering/mathematics or similar

Experience in:

- experimental methods
- programming

Host ORTA DOĞU TEKNİK ÜNİVERSİTESİ MIDDLE EAST TECHNICAL UNIVERSITY

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Dicle Dovencioglu

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8. Planning and execution of exploratory actions in the visual perception of objects

Description We will measure and model how relevant object features during exploratory action preparation and execution are automatically enhanced by an action-modulated perception mechanism. We will identify the amount of perceptual information and the priority scale needed to accurately predict subsequent motor responses, and identify patterns of eye movements that are specific during visual perception of the object properties relevant for the subsequent exploratory action.

Requires A **Masters degree** in psychology/ neuroscience/computer science/mathematics or similar

Experience in:

- experimental methods
- motion tracking (eye/hand)
- programming/ computational modeling

Host ALMA MATER STUDIORUM UNIVERSITÀ DI BOLOGNA

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Analisa Bosco

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9. Active visuo-haptic exploration of materials in a robotic biomimetic system

Description We will develop and implement models (reinforcement -&, deep learning, Bayesian approaches) of visuo-haptic active exploration of object properties and material qualities. We will test implementations against hypotheses derived from human experiments, and ultimately improve effective multi-modal robotic control.

Requires A **Masters degree** in robotics /computer science/engineering or similar

Experience in:

- robotics
- programming/ computational modeling/machine learning

Host TECHNISCHE UNIVERSITAT DARMSTADT

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Jan Peters

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10. Effects of the lighting on and around artworks on the active exploration dynamics, on learning, and on perception

Description We want to understand the effects of lighting on and around artworks on the active exploration dynamics, on learning, and on perception of the pictorial light and materials in painted scenes. We will record and characterize exploratory eye and body movements during art (exhibitions) experiences and relate those to parameters of lighting design and perception.

Requires A **Masters degree** in psychology/cognitive science/industrial/lighting design /architecture computer science/engineering or similar

Experience in:

- experimental methods
- VR/XR
- programming

Host TUDelft

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Sylvia Pont
- Maarten Wijntjes

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11. Modulation of aesthetic experience through haptic explorations

Description We will assess how exploratory haptic interaction with an object modifies the aesthetic dimensions which are typically qualified as subjective such as pleasantness and sensual quality. We will identify how such explorative qualities change over time with more frequent usage, with accompanied information and how context information modulates the perceived qualities. We will record, analyze and qualify hand-eye-coordination during exploratory haptic processes.

Requires A **Masters degree** in psychology/cognitive science/computer science or similar

Experience in:

- experimental methods
- motion tracking
- programming

Host Otto-Friedrich-Universität Bamberg

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Claus-Christian Carbon

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12. Enhancing perceptual experience in XR environments

Description Based on rigorous psychophysical measurements, we will build quantitative models on the effect of different image parameters, such as color and luminance uniformity and binocular color similarity on perceived image quality, user experience, and immersion that can be applied in XR display design. We will characterize and model eye movement behavior in XR to advance dynamic display correction in XR.

Requires A **Masters degree** in psychology/cognitive science/computer science or similar

Experience in:

- experimental methods
- eye tracking
- XR/VR/programming

Host UNIVERSITY OF HELSINKI

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Maria Olkkonen

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13. Multisensorial and pseudocues for material experiences

Description We want to understand how multisensorial material interactions can be translated to unisensorial interactions. We will capturing real-world material explorations and convert these into AI assisted interactive images based on pseudo-haptics. The goals is to understand the interaction between exploration movement, multisensorial cues, and material properties and to enhance material experience and object handling in XR environments.

Requires A **Masters degree** in psychology/cognitive science/industrial/lighting design /architecture computer science/engineering or similar

Experience in:

- experimental methods
- VR/XR
- programming

Host TUDelft

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Guis Huisman
- Sylvia Pont

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14. Explorable and interactive STEAM kits for embodied inspiration and worldmaking

Description We will develop open-source, prototype kits for exploring patterns of sound, light, and motion. We will evaluate the construction and effectiveness of integrated physical components (scaffolds, actuators, sensors), digital-twin virtual elements, controlled by next-generation behavioural design software easily accessible to novice and expert users. The aim is to enable wide interdisciplinary and cross- sectoral access for tool development, research-creation and dissemination, including non-experts such as teachers, artists, and children.

Requires A **Masters degree** in industrial/lighting design /architecture computer science/engineering or similar

Experience in:

- VR/XR
- programming

Host UNIVERSITY OF WATERLOO

PIs If you want to apply for this position, please find out if you meet the eligibility criteria listed here and get in touch with:

- Philip Beesley
- Rob Gorbet

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