

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

| Personal information | |
|----------------------|----------------------------------|
| Name | Elisabeth H.H.V. Veldkamp |
| Student number | 4648056 |

| Studio | | |
|---------------------------------------|---|---------------------|
| Name / Theme | Heritage & Architecture: Revitalising Heritage – Sustainable Libraries | |
| Main mentor | Prof. Dr. Uta Pottgiesser | Supervisor Design |
| Second mentor | Dr. M. (Emeline) Lin | Supervisor Research |
| Argumentation of choice of the studio | I chose the Heritage graduation studio due to a longstanding passion for the conservation and preservation of the historic built environment. Growing up on the island of Curacao, which hosts the historic capital of Willemstad, a UNESCO World Heritage site, since 1997, I had gained a profound awareness and appreciation for cultural history and the challenges involved in refurbishing buildings for contemporary use, while preserving their identity and rich history. My passion was strengthened even more during the MSc 1 Heritage studio, which then motivated me to explore the role of heritage in public institutions like museums and libraries. I see heritage not as a limitation but as a basis for innovation, encouraging us to reimagine and refurbish existing structures while preserving their historical significance/value. | |

| Graduation project | |
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| Title of the graduation project | UNIVERSAL INCLUSIVITY Beyond Sight, Beyond Barriers: Reimagining Library Spaces through Multisensory Accessibility. |
| Goal | |
| Location: | The Koninklijke Bibliotheek (KB): the National Library of the Netherlands. Prins Willem-Alexanderhof 5, The Hague. |
| The posed problem, | This study explores how multisensory accessibility can be integrated into library |

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| | <p>design to better accommodate diverse sensory needs. Although libraries have increasingly embraced user-centered design principles in recent years, the focus has predominantly remained on visual elements, often limiting the inclusivity of these environments. Multisensory design strategies—including tactile, auditory, olfactory, and spatial elements—offer valuable opportunities to engage a broader range of users, particularly individuals with sensory impairments. Despite growing interest in this field, a notable gap persists in both academic research and design practice regarding the effective implementation of multisensory experiences in library environments.</p> <p>In response to this, the study contributes to the future redesign of the Koninklijke Bibliotheek (KB), the National Library of the Netherlands in The Hague, by proposing evidence-based design strategies that integrate multisensory elements to enhance both user experience and accessibility. By fostering an environment that actively engages multiple senses, the KB can evolve into a more accessible, navigable, and socially engaging public space for a wide and diverse audience, with particular attention to the needs of blind and visually impaired users. The research aims to address the existing gap in library design discourse by offering practical frameworks for incorporating multisensory accessibility, ultimately repositioning the KB as an inclusive, and culturally significant landmark within the city of the Hague.</p> |
| research questions and | MQ: How can libraries be redesigned as resilient environments that foster social inclusivity and user engagement by integrating multisensory accessibility into their physical spaces? |

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| | <p>SQs:</p> <ol style="list-style-type: none"> 1. What sensory and spatial accessibility barriers do visually impaired and neurodiverse users face in libraries? 2. How can multisensory accessibility be effectively integrated into library environments to enhance social inclusivity and user engagement? |
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design assignment in which these result.

The design assignment addresses the challenge of revitalizing the Koninklijke Bibliotheek (KB), the National Library of the Netherlands in The Hague. The core problem is the building’s accessibility barriers for (visually) impaired users. Through the lens of heritage and adaptive reuse, this project investigates how multisensory design strategies, such as the integration of tactile, auditory, and spatial features, can enhance accessibility, intuitive navigation, and overall user experience. The transformed KB could offer a radical change: from a closed, confusing, and visually dominating institution to an open, navigable, and multisensory cultural landmark. This shift is based on the notion that space should communicate not only through sight but also through all senses, providing significant, inclusive experiences for all users, particularly those who are visually impaired, or neurodiverse. The objective is to create a design strategy that preserves vital heritage values of the KB, while integrating a new program and spatial strategy, that reflects the evolving role libraries in society.

Process

Method description

This study will make use of a qualitative methodology, which will include both an analysis of case studies and a comprehensive review of the relevant literature.

The case study analysis consists of examining three public libraries that have incorporated multisensory design elements into their architectural frameworks.

1. Openbare Bibliotheek (OBA) in Amsterdam, The Netherlands by Jo Coenen & Co Architecten – with emphasis on multisensory accessibility through tactile design features, soundscapes for wayfinding, sensory relief rooms, and interactive multimedia rooms.
2. Helsinki Central Library Oodi in Finland by ALA Architects – with emphasis on multisensory accessibility through sensory installations, tactile surfaces, wayfinding systems, and navigation through textures.
3. Durham County Library in North Carolina, USA by Vines Architecture – with emphasis on multisensory accessibility through multisensory environment rooms, assistive technologies, calming spaces, and flexible usage areas.

The literature review will establish a theoretical framework by examining existing research on multisensory accessibility within cultural institutions, including libraries and museums. Topics include multisensory environments, obstacles faced by people with

impairments, and physical accessibility. The primary data will consist of accessibility guidelines, in addition to peer-reviewed journals, articles, books, and policy documents.

Given the limitations in time and scale, it is unrealistic to include the full spectrum of impaired and neurodiverse users in this study or for the proposed library redesign. Thus, those with visual impairments will be the main representation for the user groups, as they represent the most prevalent demographic among people with impairments.

Literature and general practical references

Sources (academic literature, books, journals):

Bakir, D., Mansour, Y., Kamel, S., Moustafa, Y., & Khalil, M. H. (2022). The spatial experience of visually impaired and blind: an approach to understanding the importance of multisensory perception. *Civ Eng Archit*, 10(2), 644-58.

Cho, J. D. (2021). Multi-sensory interaction for blind and visually impaired people. *Electronics*, 10(24), 3170.

Deines-Jones, C. (Ed.). (2007). *Improving library services to people with disabilities*. Elsevier.

Goldsmith, S. (1997). *Designing for the disabled*. London: Architectural Press.

Kwafoa, P. N. Y. (2019). Visually impaired access to library services: The role of library infrastructure. *Library Philosophy and Practice*, (e-journal), 1–19.

Limburg, H., & Keunen, J. E. E. (2009). Blindness and low vision in The Netherlands from 2000 to 2020—modeling as a tool for focused intervention. *Ophthalmic Epidemiology*, 16(6), 362–369. <https://doi.org/10.3109/09286580903312251>

Lupton, E., & Lipps, A. (Eds.). (2018). *The senses: Design beyond vision*. Chronicle Books.

Mesquita, S., & Carneiro, M. J. (2016). Accessibility of European museums to visitors with visual impairments. *Disability & Society*, 31(3), 373–388. <https://doi.org/10.1080/09687599.2016.1167671>

Momoh, E. O., & Folorunso, A. L. (2019). The evolving roles of libraries and librarians in the 21st century. *Library Philosophy and Practice* (e-journal), 2867.

Pallasmaa, J. (1996). *The eyes of the skin: Architecture and the senses* (3rd ed.). Wiley. [ISBN 978-1-1199-4128-6].

Wiethoff, M., Sommer, S., Valjakka, S., Van Isacker, K., Kehagias, D., & Tzovaras, D. (2008). User needs for mobility improvement for people with functional limitations. In S. Pinder (Ed.), *Advances in human-computer interaction* (pp. 595–604). I-Tech Education and Publishing.
<https://repository.tudelft.nl/islandora/object/uuid%3A8b8d9e99-d456-4b44-906b-1eaa6be4b481>

(and more)

Practical references:

1. **Openbare Bibliotheek Amsterdam (OBA):** for spatial organization and sensory zones
2. **Helsinki Central Library Oodi:** for inclusive public programming and tactile design
3. **Durham County Main Library:** for sensory calming spaces, multisensory environments, tactile displays and assistive technologies
4. **SEALAB School for the Blind (India):** for tactile and non-visual navigation design

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

This graduation project is in line with the studio topic of Revitalising Heritage, focusing on the adaptive reuse and redesign of the Koninklijke Bibliotheek (KB) in the Hague. The project corresponds directly with the studio's fundamental questions by focusing on the preservation and transformation of a heritage site into a public space that is socially inclusive and multisensory. Located within the Architecture track and the Architecture, Urbanism and Building Sciences MSc programme, this project intends to integrate architectural design, spatial reorganization and academic research to create innovative solutions to enhance accessibility, social inclusivity and user experience. It tries to address societal demands, while preserving heritage.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

Socially, this project tackles pressing issues of inclusivity and accessibility by rethinking the functionality of heritage buildings for visually impaired individuals, users groups often overlooked in design. It pushes architects to transcend beyond mere visual aesthetics to incorporate multisensory environments into their overarching design responsibilities. Scientifically, this project adds to the growing body of knowledge in the fields of spatial cognition, multisensory design and heritage preservation. The graduation project tries to integrate sensory design practices with heritage values, providing a framework for accessible redesign.

