Tactile Representation of Diagrams on 2D Tactile Refreshable Displays (Bachelor Thesis)

ACCESS@KIT - Zentrum für digitale Barrierefreiheit und Assistive Technologien

Diagrams and charts present accessibility challenges for individuals who are blind or visually impaired (BVI), often requiring conversion into text descriptions, which can result in the loss of crucial spatial information. Thus, the objectives of this work involve evaluating existing techniques for diagram and chart analysis to gain insight into their current strengths and limitations. Additionally, this work includes introducing a novel approach that utilizes machine learning (ML) models for data extraction from diagrams. Furthermore, it includes the development of a new graphical user interface (GUI) tool designed for sighted users, enabling them to modify the extracted diagrams and transform them into an accessible SVG format. This accessible format can subsequently be displayed on 2D tactile refreshable displays or printed on embossed paper, enhancing accessibility for BVI individuals.

Tasks:

1. **Model Training and Experimentation**: Investigate various model variations and incorporate innovative components to improve diagram extraction.
2. **GUI Development**: Create a user-friendly interface for generating accessible SVG diagram formats.
3. **Formal User Study**: Conduct a comprehensive evaluation of the tools developed in a user study to ensure their effectiveness.

Requirements:

- Interest in the subject of accessibility.
- Knowledge of GUI programming in any language.
- Basic Knowledge in machine learning.

If you're interested in this opportunity, please submit your application, including your CV and academic transcripts, to any of the designated contacts.

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