

# Using Crowdsourced Image Annotations for Assessing Sidewalk Accessibility

## 11 Aug 2022

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### Proposal

AI Thesis project proposal

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### Project Title

Using Crowdsourced Image Annotations for Assessing Sidewalk Accessibility

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### Project Description

The City of Amsterdam has the ambition of making Amsterdam a city where everybody is able to participate as independently and equally as possible. Thus, we have started the [Amsterdam for All](#) project, which aims to research how we could use artificial intelligence to measure and improve the accessibility of our city.

One of the initiatives within Amsterdam for All is a collaboration with [Project Sidewalk](#) - a project by the University of Washington the goal of which is to develop scalable data collection methods for acquiring sidewalk accessibility information using a combination of crowdsourcing, computer vision, and online map imagery. In the past months, we have worked together with [people from the autistic spectrum](#) on labelling the first few [neighbourhoods in Amsterdam](#). Now, we would like to further research how we could use the collected annotations to automatically analyse the availability of traffic lights, crosswalks, curb ramps, and surface issues in the rest of the city.

The current annotations consist of panorama images (including geo-location), together with the corresponding point labels added at the base of the different types of objects (curb ramps, traffic lights, etc). While [recent research](#) already showed promising results for using these annotations for image classification, we would be interested to see whether we could replicate the findings for the new Dutch dataset and if we could extend this work to an object detection setup. Furthermore, we could explore the possibility of incorporating additional information about the severity and condition of the corresponding assets or obstacles to refine the predictions.

A second possible research direction would be to incorporate the available information about user interactions and validation cycles for improving the results. While the [previous research](#) only found small improvements when training a model only on the annotations which were positively validated in the platform, they did not take into account further information about the corresponding users, their overall performance and their interactions with the platform, nor did they take into account any information about nearby labels.

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### Work environment

Within the City of Amsterdam, you will work with experts from the Chief technology office, and more specifically the dedicated AI Team. More AI specialists and engineers within the City of Amsterdam and our partner network will be available for occasional brainstorming sessions and workshops. Once a week all AI & Data Science students gather for more in-depth technical support.

What we offer:

- Freedom and responsibility
- Working in a team of experienced people
- Successful outcomes are directly implemented
- A possibility to contribute to (your own?) smart city development
- A monthly internship compensation

What we expect:

- An independent work ethic
  - Machine learning knowledge
  - A keen interest in working with panorama images
  - Python programming skills
  - And most importantly: a passion for their field, an ambition to learn, and a drive to make Amsterdam even more beautiful, safe and sustainable!
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### Expectations

The most important thing is to be eager to explore and learn together and step out of the comfort zone. The aim is to achieve results directly applicable and relevant to the municipality. (i.e. not merely an academic paper). In addition to the delivery of useful predictive models, relevant results also include byproducts of the whole data analysis/processing pipeline that could be turned into insightful reports.

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**Duration**    **MSc AI: 8 months**

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**Programmes**    **This project is exclusively for MSc AI students**

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### Number of Students

1

### 2. Research Tags

Please choose a maximum of three individual tags

- 2.1 Amsterdam Machine Learning Lab
- 2.2 Computational Science Lab
- 2.3 Computer Vision.