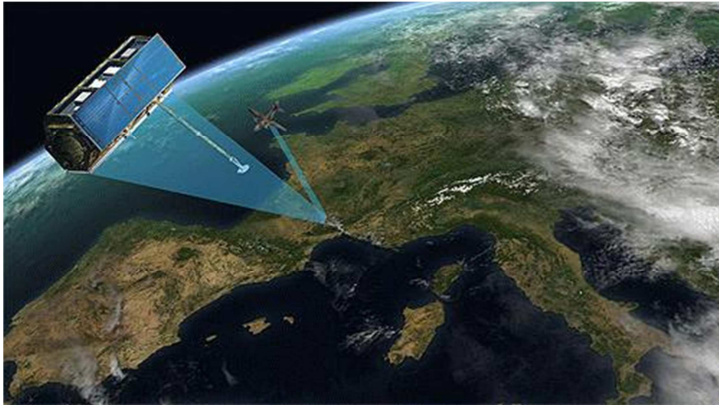


### Analysis of urban flood events from radar satellite images



#### Introduction

Can we detect urban flood events from the sky? Floods are notoriously hard to monitor because they happen at unexpected times and places. In the Netherlands, large-scale floods rarely occur because of the high protection levels provided by dikes and levees. Conversely, small-scale urban floods happen with a high frequency of up to several times per year. Knowing the extent of these floods is important for model calibration and for urban water managers to be able to decide whether investments are needed to reduce the flood risk and to evaluate damage claims from citizens and industry.

#### Objective of MSc-research project

The objective of this MSc-project is to use radar satellite images to detect urban flood events. Data from the TerraSAR-X satellite will be used for this purpose; the satellite passes twice per day. A first step will be to select flood events (from rainfall data, news media, claim data) that coincide with passage of the satellite. TerraSAR-X data should in principle be suitable for urban flood detection because of the high resolution. In the absence of significant wind or rain, flooded urban areas would generally appear dark on the satellite images. However, due to the side-looking nature of SAR, substantial areas of ground surface may not be visible due to shadowing and layover caused by buildings or taller vegetation. Still, even if only disjoint sections of waterline could be detected, this would be very useful for model calibration and validation, as these could be compared to corresponding waterline heights predicted by an inundation model.



#### Supervisors:

Marie-claire ten Veldhuis  
Ramon Hanssen

#### Contact:

Marie-claire ten Veldhuis  
Kamer: 4.65  
T: (+31) (0)15 2784734  
E: j.a.e.tenVeldhuis@tudelft.nl