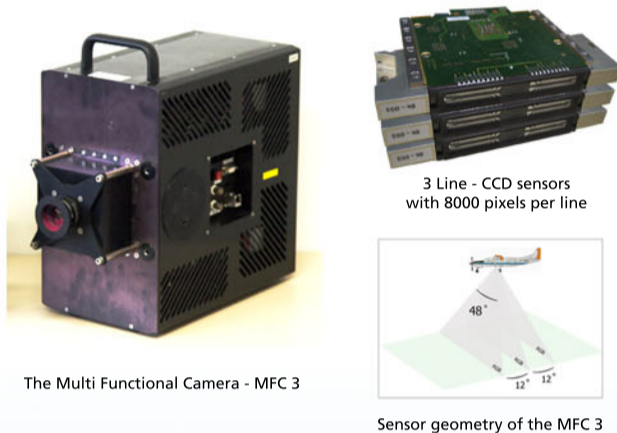


Classifying high resolution image data in Southeast Asian urban areas using MFC line scanner data

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In 2007 German Aerospace Center (DLR) developed a new push-broom sensor. The MultiFunctional Camera (MFC) is a three-line-push broom scanner for terrestrial and airborne applications. One to five autonomous RGB-CCDs with 6.000 to 14.000 pixels can be used to record image data. In general the optic is exchangeable. Three RGB-CCDs with 8000 pixels and an 80mm optic were used to acquire image data of Padang/ Sumatra.



The project area covers about 120 km² including the centre of town and the harbour. With the photogrammetric processing, an orthophoto mosaic and a digital surface model were generated. The geometric resolution of the image data and the DSM is 12cm.



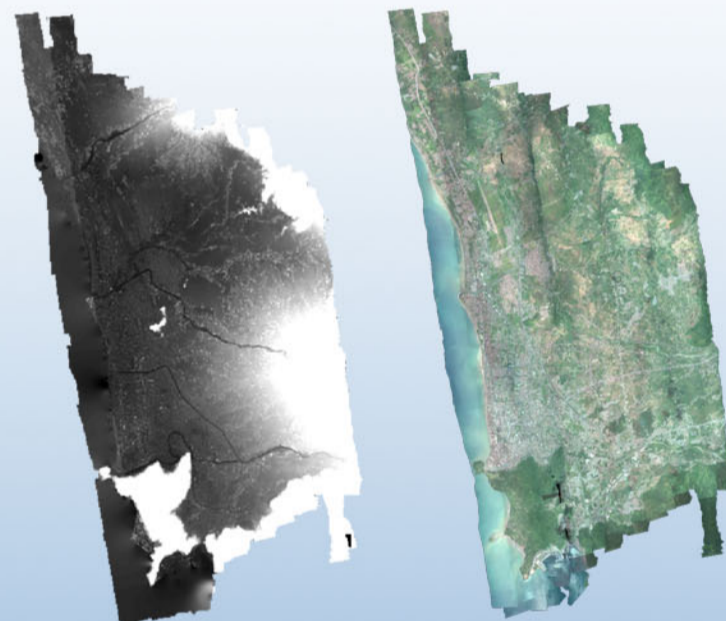
Location of the project area



Aerial view of Padang

In this project, the image data and the resulting DSM was used to classify the land use of the city of Padang. High resolution of image data and surface model is essential to analyse urban regions satisfactorily and in great detail. On the other hand the heterogeneity caused by the very high resolution makes this analysis very complex.

This study shows how a DSM can be used to support the image analysis. A near infrared band is not (yet) integrated. This causes difficulties in separating vegetation from no vegetation. Still, using geometric image information and the high resolution DSM can minimize these problems. By generating a normalized DSM which provides object heights irrespective from surface elevation very good classification results can be achieved.



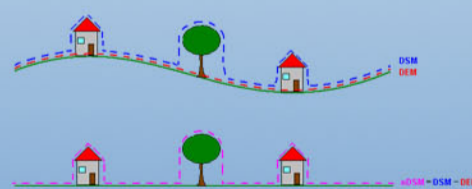
Digital surface model of the project area

Image mosaic of all orthophotos of the project area



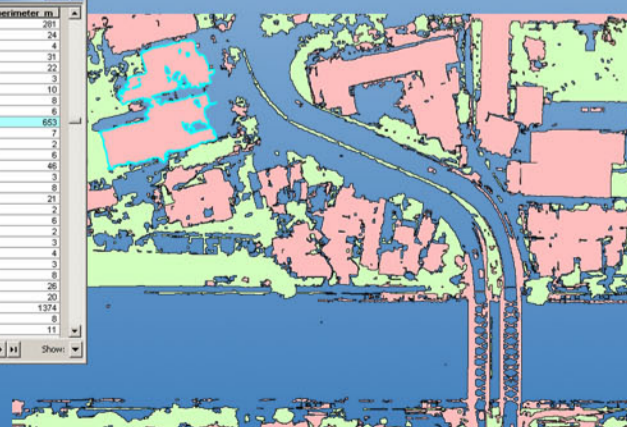
Subset from an orthophoto of Padang

Definiens Developer and Definiens Server software technology was applied to classify the whole city using the tiling and stitching tool. Due to changing conditions during the flight campaign the classifying algorithm had to be adapted to the image data. This process adaptation was done using Definiens action library.



The classification results can be easily exported to a geographical information system (GIS) as shape- or Autocad dxf-file. The GIS can be used to quickly generate large scale maps in urban areas especially in developing countries and emerging markets, where new maps are essential for land management purposes, urban planning and monitoring.

id	Shape	area m ²	perimeter m
587	Padang	291	211
588	Padang	11	24
589	Padang	1	4
590	Padang	19	21
591	Padang	7	22
592	Padang	0	3
593	Padang	2	10
594	Padang	2	8
595	Padang	1	6
596	Padang	1790	653
597	Padang	1	7
598	Padang	0	2
599	Padang	1	6
600	Padang	29	46
601	Padang	0	3
602	Padang	3	8
603	Padang	5	21
604	Padang	0	2
605	Padang	1	6
606	Padang	0	2
607	Padang	1	3
608	Padang	1	4
609	Padang	1	3
610	Padang	2	8
611	Padang	11	26
612	Padang	3	20
613	Padang	3974	1374
614	Padang	1	8
615	Padang	7	11



Shape files exported from the classification results



- buildings
- streets
- vegetation
- water bodies
- sand
- unclassified

Classification result of the same scene