

WebMGS 2010

1st International Workshop on Pervasive **Web Mapping**, **Geoprocessing** and **Services**
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A WEB-BASED APPROACH FOR ONLINE DIGITAL TERRAIN MODEL AND ORTHOIMAGE GENERATION

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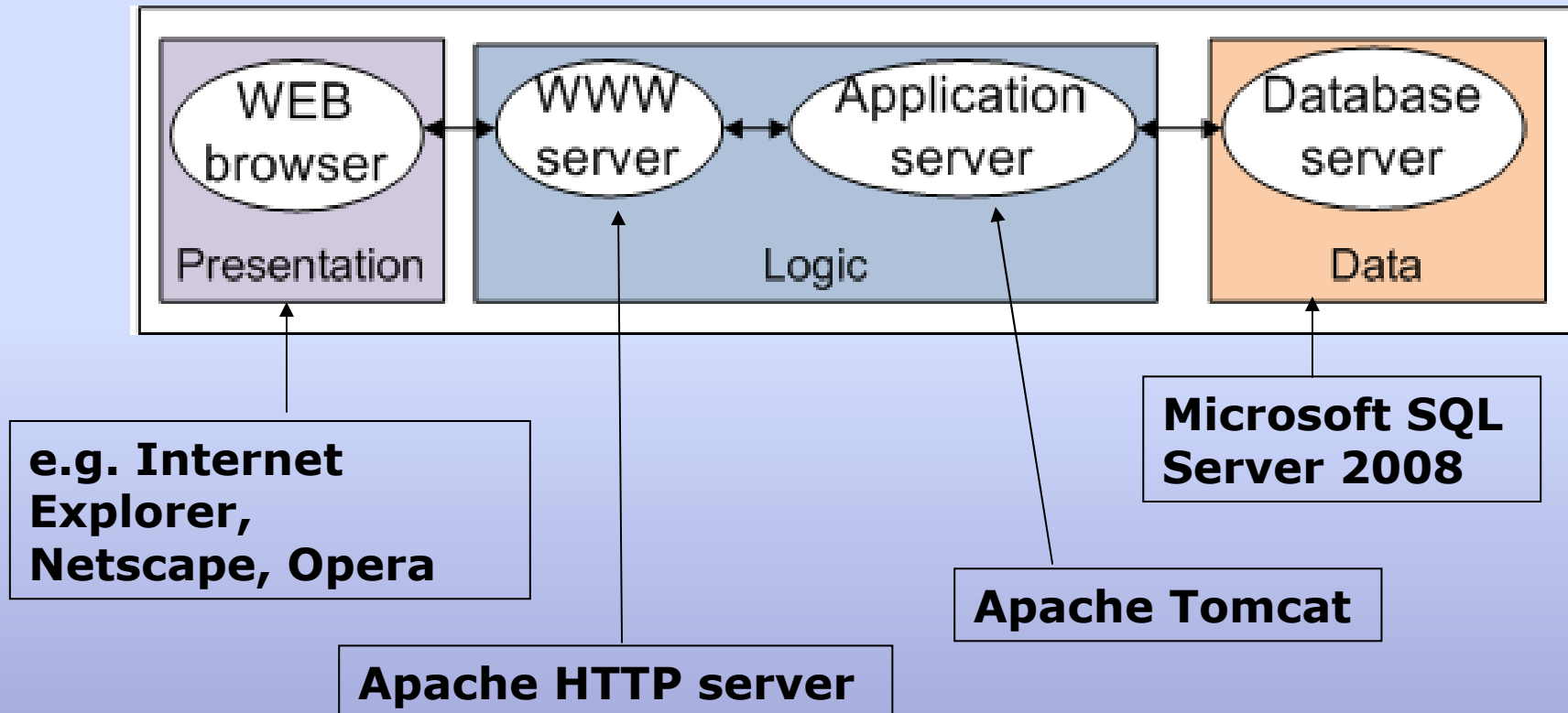
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Poland



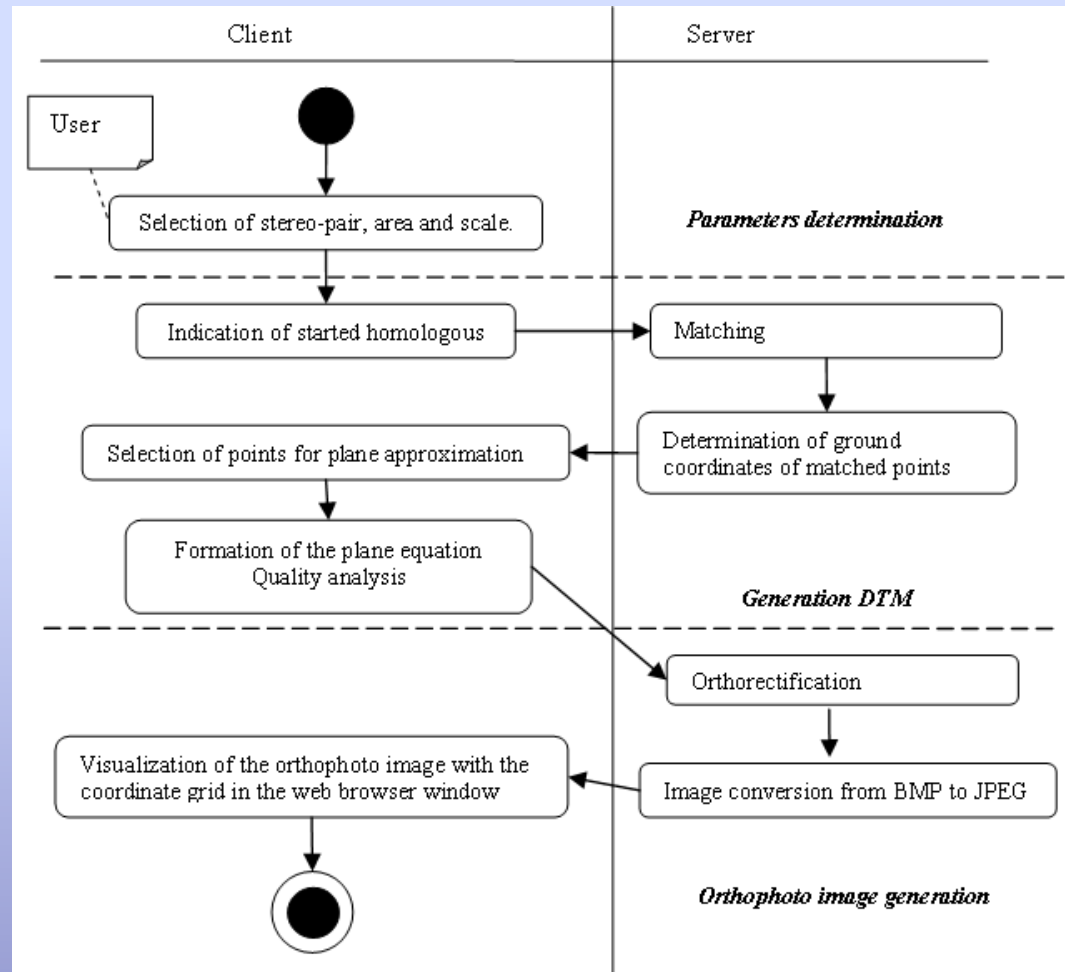
Architecture of web application destined for aerial photogrammetry



<http://www.kfit.uwm.edu.pl/zp/zp.html>

Project (All Rights Reserved)	Fuctions	Browsers
Orthophoto	Visualization, (X,Y) co-ordinates, area.	Mozilla,Netscape,IE, and J2SE RE
Measurements on the aerial photos EuroSDR Project	Stereopair, matching, anaglyph, (X,Y,Z), distance, area.	Mozilla,Netscape,IE, and J2SE RE
OEEPE test	Exterior orientation	Mozilla,Netscape,IE, and J2SE RE
DTM	DTM generation	Mozilla,Netscape,IE, and J2SE RE
Fiducial marks EuroSDR Project	Interior orientation (Java Swing)	Mozilla,Netscape,IE, and J2SE RE
Relative orientation	Relative orientation Fundamental matrix (SVD)	Mozilla,Netscape,IE, and J2SE RE
Orthophoto	Orthophoto generation	Mozilla,Netscape,IE, and J2SE RE

ALGORITHM OF DTM AND ORTHOIMAGE GENERATION



THE EXAMPLE OF ONLINE DTM AND ORTHOIMAGE GENERATION

Selection:

- stereopair
- pyramid level
- image size

preview of the selected photos

i	x1	y1	x2	y2	X	Y	Z
0	8960.0	6580.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0



define initial parameters of the image matching process

pixel coordinates of the subimages center

Simplified DTM



point for finding the plane equation coefficients are selected by the user

Accuracy assessment of the model

Accuracy assessment of the model

$Z = Z(X, Y)$

$Z = -0,0518 X + 0,0229 Y + 250486,8$ **RMS=0,9m**

200x299

i	X	Y	Z	weight Z
232	7465168...	5959101...	115.81	1
233	7465168...	5959098...	114.59	0
234	7465168.0	5959094...	113.91	0
235	7465167.9	5959091...	114.34	1
236	7465167...	5959087...	114.22	0
237	7465167...	5959084...	114.09	0
238	7465167...	5959080...	113.96	1

Orthoimage

X,Y: 7465164.87 5959077.61
 dx,dY: 86.67 83.89
 dx<267.1m dy<207.8m
 Scale 1: 1000

$Z = AX + BY + C$

Orthoimage

Z=Z(X,Y)

Z = -0,0518 X + 0,0229 Y + 250486,8 RMS=0,9m

200x299

i	X	Y	Z	weight Z
232	7465168....	5959101....	115.81	1
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238	7465167....	5959080....	113.96	1

Orthoimage

X,Y 7465164.87 5959077.61

dX,dY 86.67 83.89

dx<267.1m dy<207.8m

Scale 1: 1000

Setup the extent and the scale of the orthoimage

R. Orthophoto: X= 7465123.4 Y= 5959154.4 dr=0.26m sc=1:1000 pix: x2= 1714 y2= 6568

7465100 7465150 7465200

5959000 5959050 5959100

CURRENT POSSIBILITIES AND LIMITS

Advantages

- no necessity to instal and update (only JVM must be instaled)
- no limit of operating system and low system equipment requirements
- no limit of users (it depends on the server capabilities)
- access to the applications and data possible from any computer at any place and any time
- possibility of use large data reasource
- use in education (high didactic value)

Limits

- necessity of processing the image fragments
- lack of the possibility to use server disk storage by the user
- no true stereo measurements
- simplified method of DTM interpolation

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Thank you for your attention!



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