

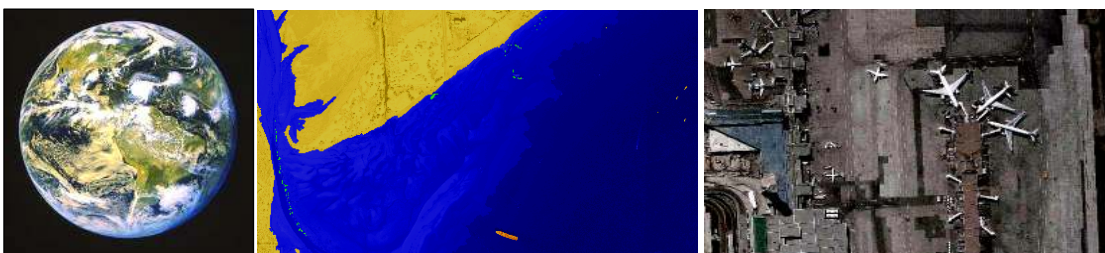
Definiens Enterprise Image Intelligence

**The scalable platform for
Image Intelligence Solutions**

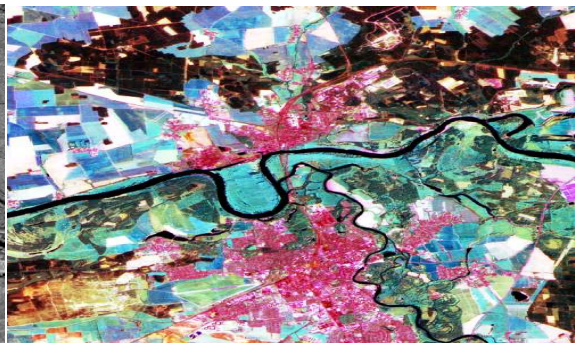
Dr. Waldemar Krebs,

Webinar

Remote Sensing Imagery: A Great Source for Geointelligence



- From overview to detail
- Recent information on any areas around the world
- More than eyes can see





Company Background

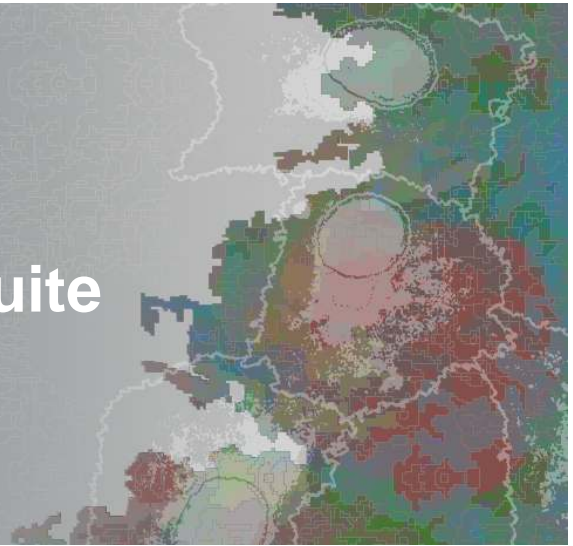
- 1995: Research ,Think-Tank‘**
Created by Physics Nobel Prize Laureate Prof. Dr. Gerd Binnig
- 1998: Cognition Network Technology (CNT)**
20+ international patents
- 2000: Commercialization**
Funded by TVM and CIPIO Partners
- 2003: Focus on Image Intelligence**
- 2004: Focus on Life Sciences and Geospatial Intelligence**
- 2007: Staff 80, 2500+ licenses worldwide,**
HQ Munich, US operations



About Definiens Enterprise Image Intelligence

- Definiens Enterprise Image Intelligence is the only technology that understands images similar to the human mind.
- Definiens provides breakthrough Enterprise Image Intelligence to customers like NGA, Lockheed Martin, DigitalGlobe, European Commission, SaudiAramco etc.
- Other technologies are still focused on single PC performance and pixel based image analysis, whereas Definiens uses object and context based technology.
- Definiens Image Intelligence provides scalable solutions from laptop to production centre and thus guarantees maximum performance.

Definiens Enterprise Image Intelligence Suite



What kind of object?





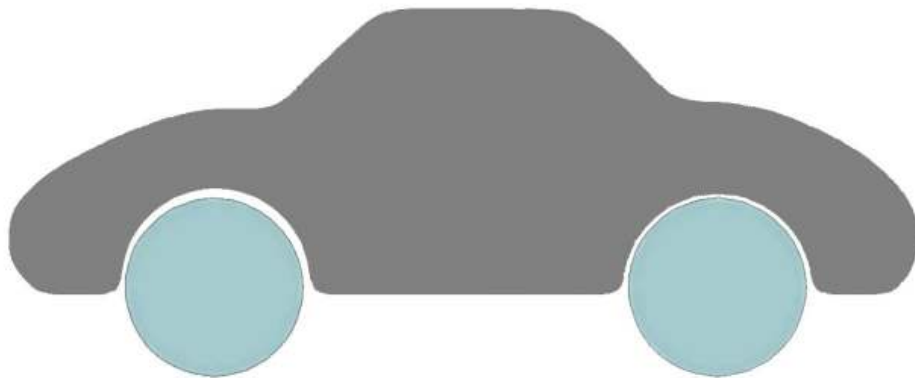
What kind of object?



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There are other possibilities



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Object Oriented Thinking

For dealing with complexity we think in terms of
objects and their **relations**



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Abstraction Through Classification

In terms of **Classes** of
objects and their relations

Abstraction: *Forget about the details – it is a fork*

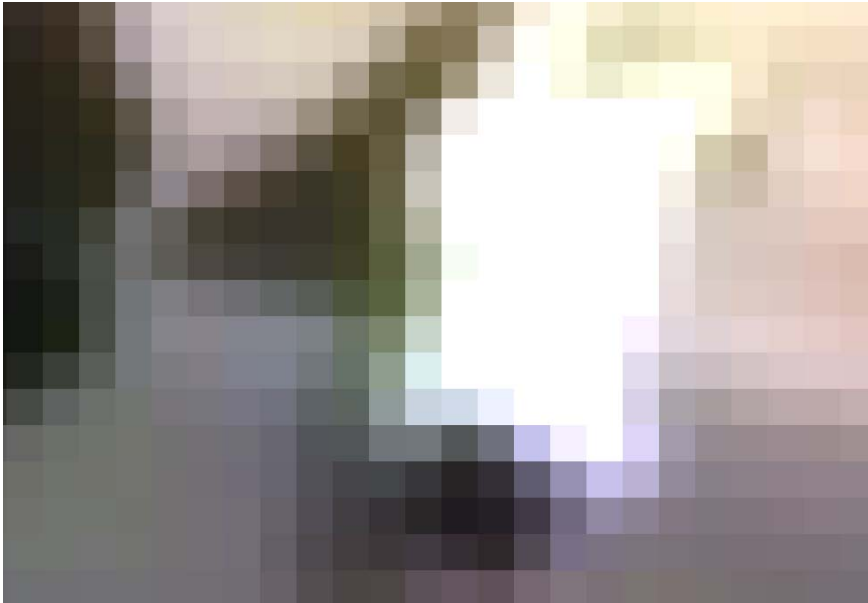


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Why object oriented image analysis?

What do you see?



Why object oriented image analysis?





Why object oriented image analysis?

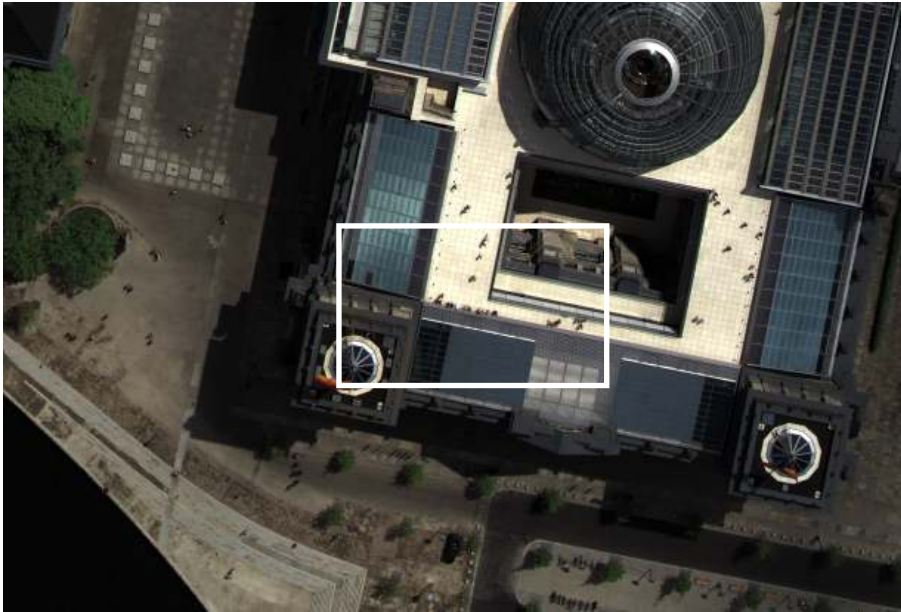


Why object oriented image analysis?





Why object oriented image analysis?



Why object oriented image analysis?



Image: ZI Imaging Germany



Why object oriented image analysis?

Human visual perception



» works on multiple scales simultaneously



» uses context information



» and groups pixels into meaningful objects



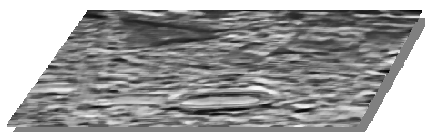
Data Fusion



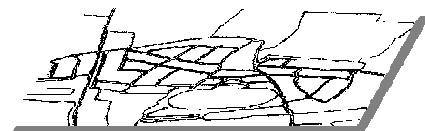
Aerial photos



Satellite images



Thematic grid information



GIS vector data

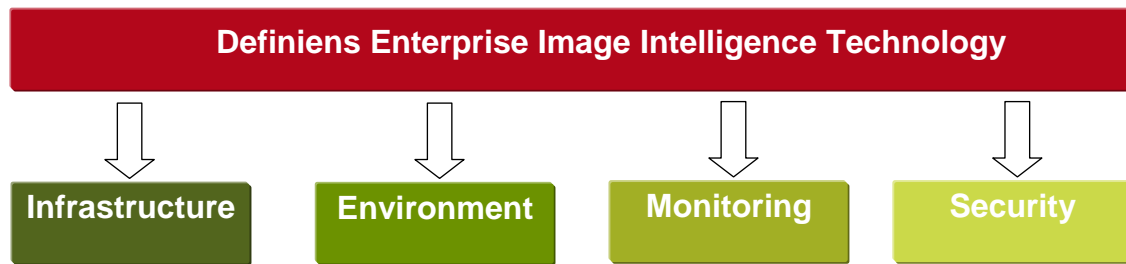
Powerful data and information fusion

Combine data from a large variety of formats, sensors and platforms

Fuse information of any spatial and spectral resolution

Integrate thematic raster and vector files

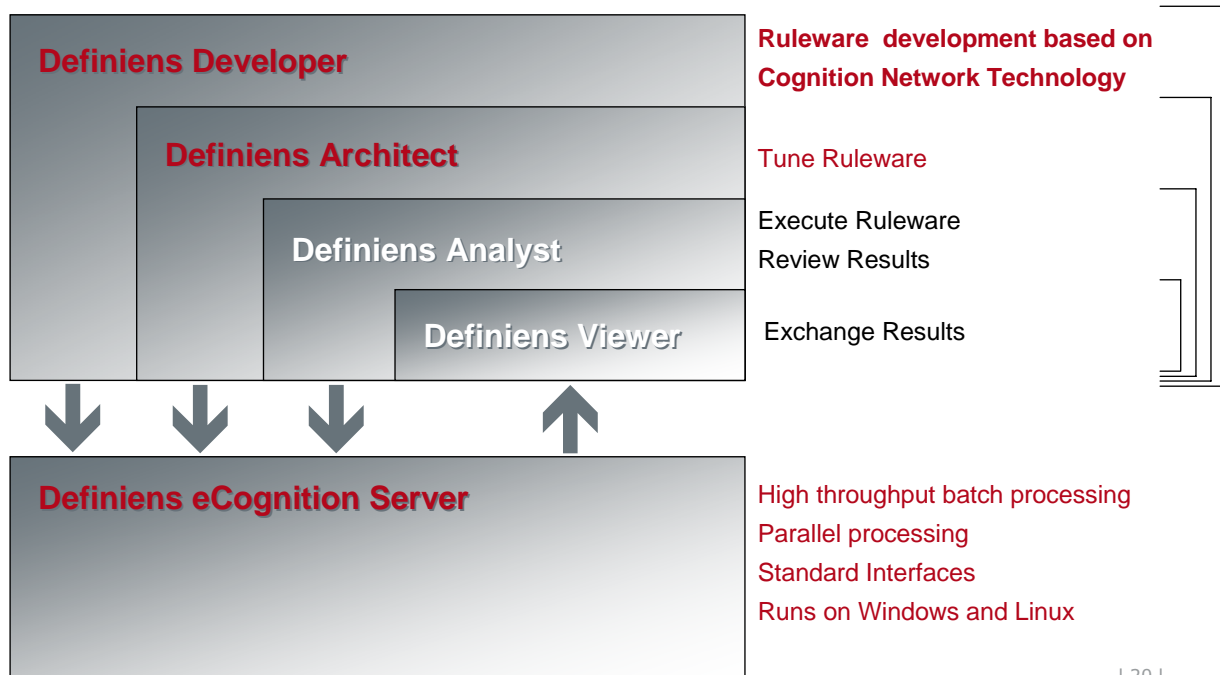
Cross-cutting Approach



- Development and production environment
- Considerable savings in time, money and resources
- One technology for all image interpretation applications
- New applications can be developed without buying new software
- Easy change detection

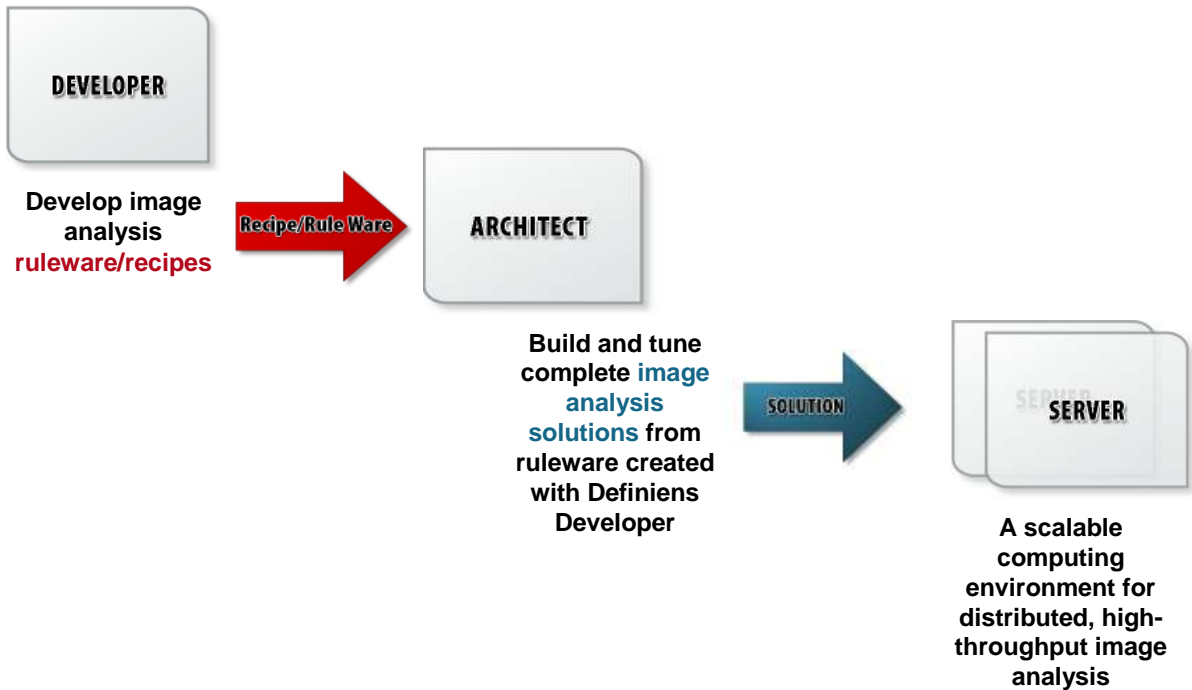
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Definiens Enterprise Image Intelligence Suite (EII)



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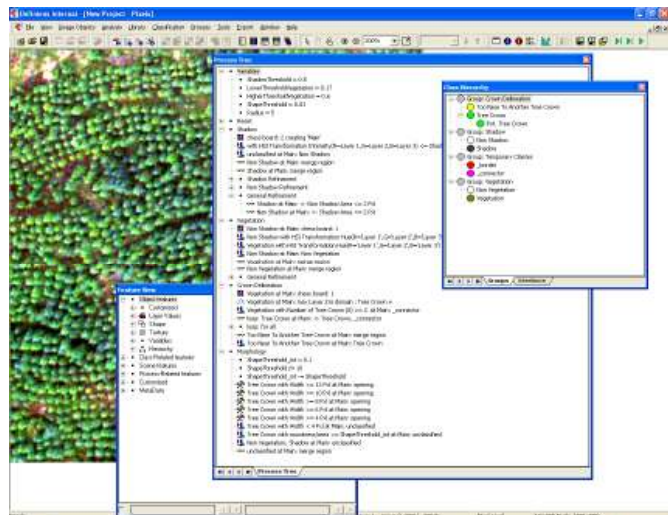
Introducing the Enterprise Image Intelligence Suite and Workflow



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Definiens Developer - Solution Ruleware Editor

- Ruleset development
- Create new and extend existing libraries
- Define user interface
- Publish libraries for use in Definiens Architect

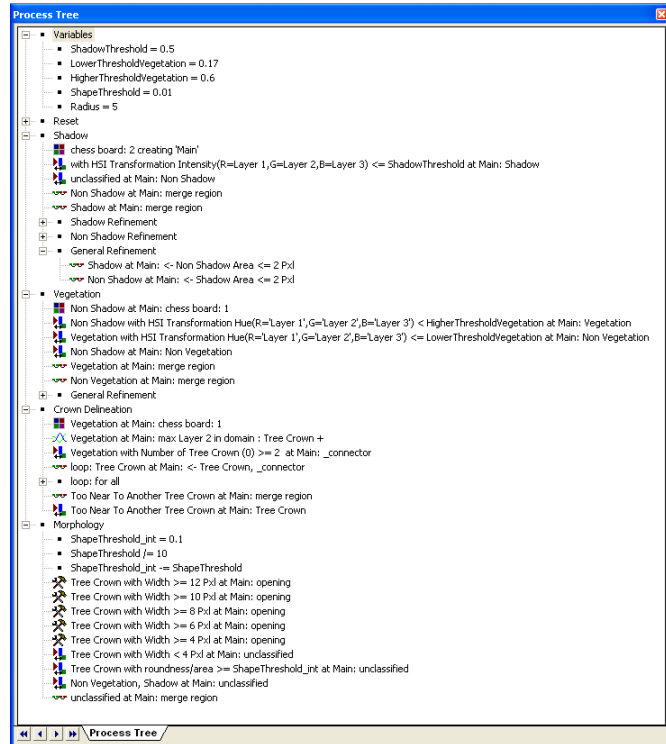


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Definiens Developer - Solution Ruleware Editor

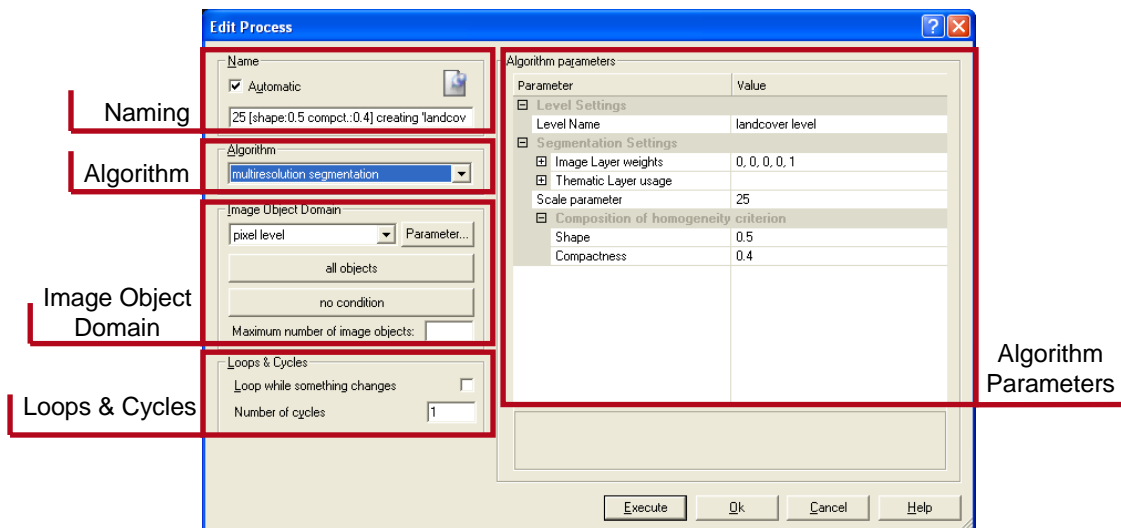
- The Process Tree
- Cognition Network Language (CNL)

Cognition Network Language (CNL) - A powerful language for developing image analysis formulas. A single process is the elementary unit of a rule set providing a solution to a specific image analysis problem. Processes are the main working tools for developing rulesets.



Easy Ruleset Development

- The New GUI



The Process Editor - The interface allows easy selection of algorithms, quick changes to algorithm parameters and selection of image object domains.



What's new in EII 6.0 - Developer

- Improved workspace management
- Improved customized import of data
- Very large image support
- Multi-scale image workflow
- Automation of tiling & stitching

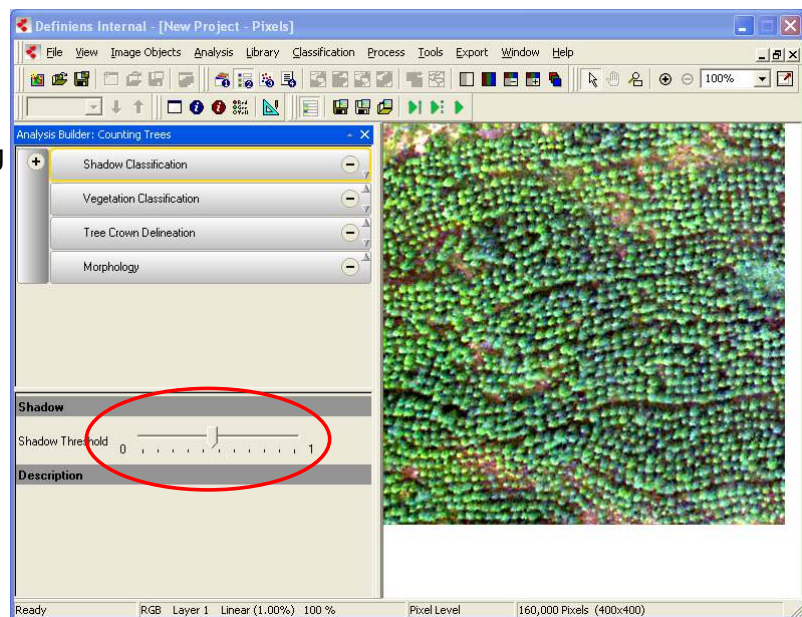


Definiens Architect → Custom-Tailored Applications

Break down complexity

Adjusting rule sets considering different image conditions

Simple solutions tailored to specific customer requirements



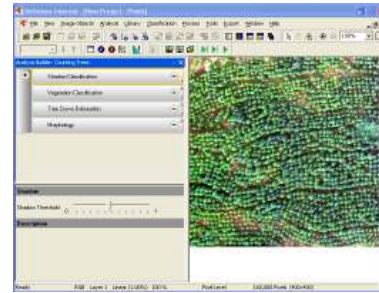
**Slider for interactive adjusting of threshold for classification
=> calibration of rule set according to different image conditions**

Definiens Server → Scalable Server System

Scalable client/server system

Parallel processing

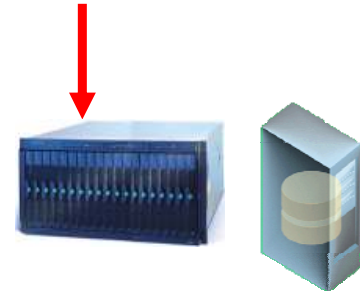
Significant reduction of processing time



Name	State	Time	Type	Remarks
Subset02	Processed	00:01:49	Original	s7110n002 / 2828 / 6.0.0 Build...
Subset03	Processed	00:00:57	Original	s7110n002 / 2316 / 6.0.0 Build...
Subset04	Processed	00:01:12	Original	s7110n002 / 2040 / 6.0.0 Build...
Subset01	Processed	00:00:19	Original	s7110n002 / 3208 / 6.0.0 Build...

Summary	
Scene name:	Subset03
State:	Processed
Time:	00:00:57
Remarks:	s7110n002 / 2316 / 6.0.0 Build 688

Export Specification	
1	C:\Documents and Settings\wkrebs\Desktop\Webinar\Webinar\Webinar\Workspace\Counting Trees\dpr\Subset03.v4.dpr



Definiens eCognition Server
Server Room

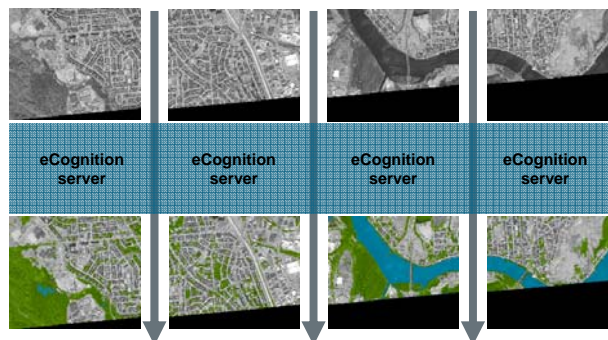
eCognition Server – Tiling and Stitching

Tiling of full scenes



Definiens Analyst/Architect

Parallel processing of tiles



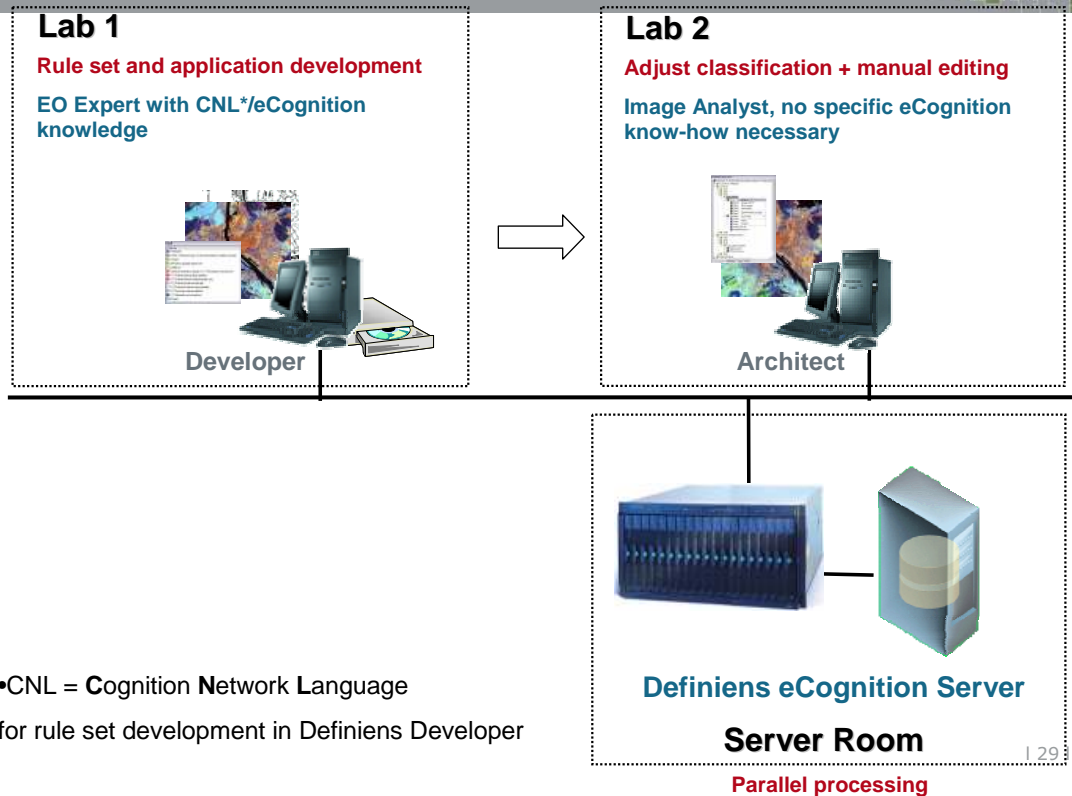
Definiens eCognition Server

Stitching of tiles



Definiens Analyst/Architect

Workflow In New Client – Server Architecture



Benefits

Definiens Developer, Architect and Server

- Development and production environment
- Increases efficiency and saves costs in production of geo data from remote sensing data
- Workflow can be split in rule set / solution development and production
- Architect:
 - Breaks down complex rule sets to simple solutions
 - Supports users in solving specific problems with a high level of automation
 - Provides robust technology to achieve excellent results on a variety of data

Advantages towards Definiens Professional

- Use of variables makes rulesets more transferable
- Automated tiling & stitching
- Parallel processing

Live Demo



Tree Crown Detection from RGB Aerial Photographs

Overview: Definiens developed an automated technique for detecting and counting young conifer trees from RGB aerial photographs.

- Image Type: RGB Aerial Photographs
- Resolution: 17 – 22cm
- Location: Scotland
- Contractor: Forestry Commission of Great Britain

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Live Demo



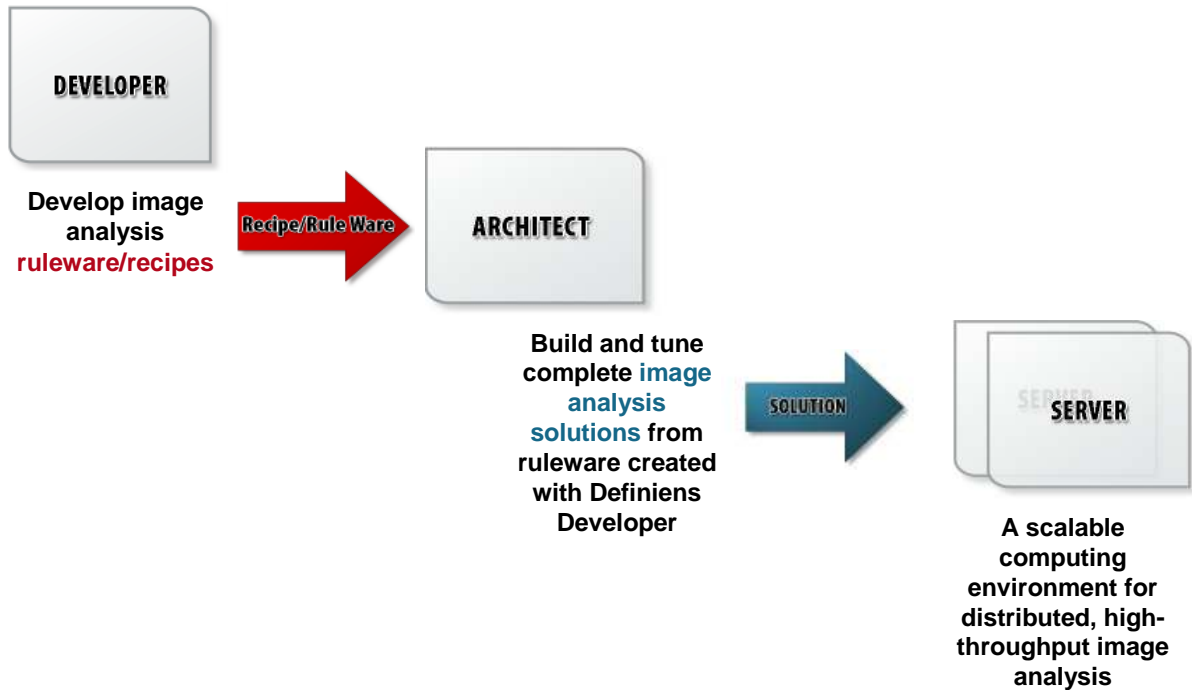
Tree Crown Detection from RGB Aerial Photographs

Definiens developed an automated technique for detecting and counting young conifer trees from RGB aerial photographs.

- Shadow Classification – extract shadow from roi using intensity
- Vegetation – detect vegetation using color
- Tree Crown Delineation – extract crown and grow using watershed
- Morphology – shape refinement using morphology algorithms

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Introducing the Enterprise Image Intelligence Suite and Workflow



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Thanks for your attention !

For further information please contact:

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Definiens AG

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Fax: +49 89 23118080
E-mail: wkrebs@definiens.com

Once you have used eCognition and comparing to pixel based analysis - there is no going back »

Jeff Thurston, Geoinformatics Magazine

eCognition

eCognition
Version 4.0

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Thank you!

www.definiens.com