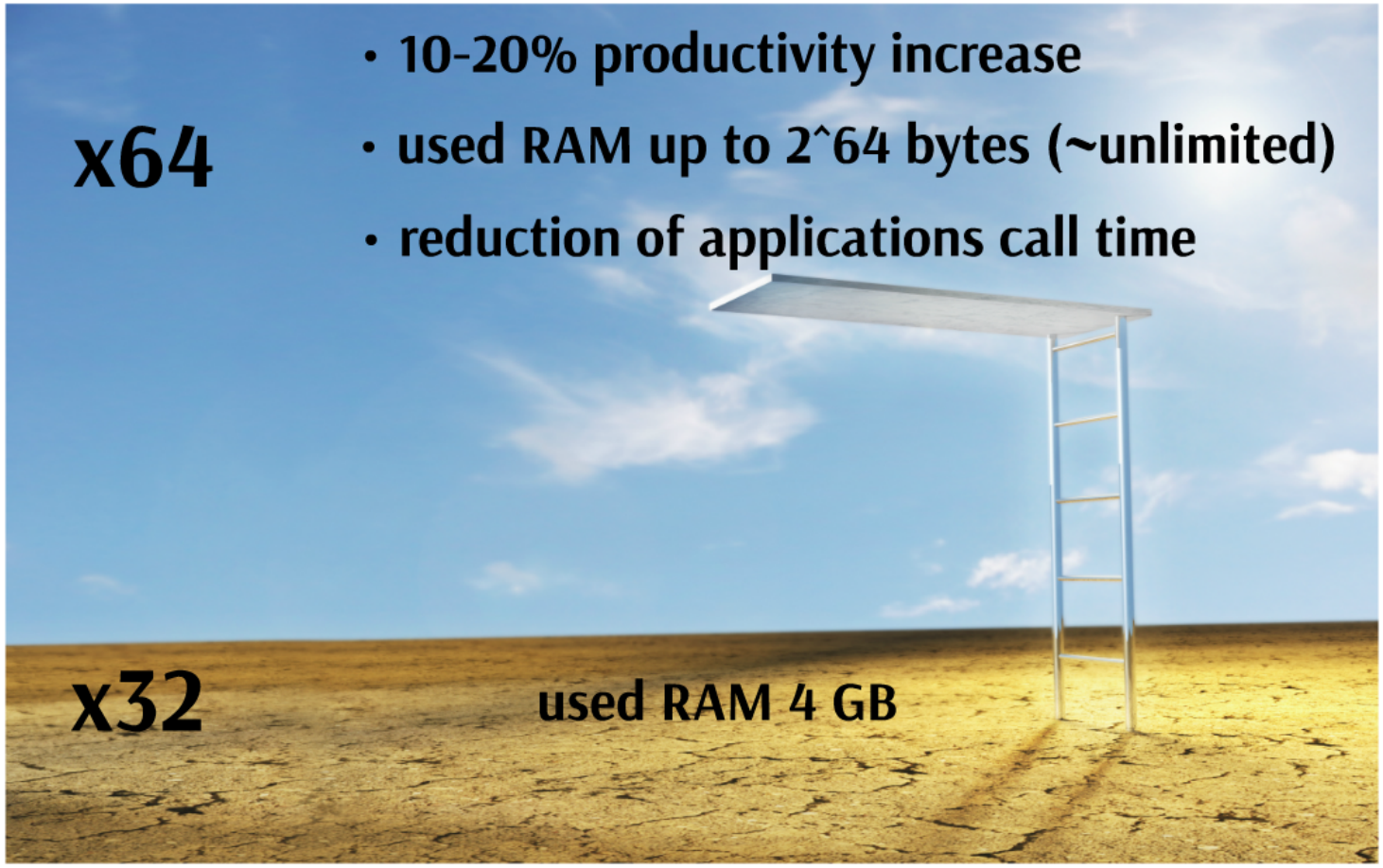
# PHOTOMOD 6.0. High productivity and big data volumes

Dmitry Kochergin,
Head of Technical Support Department

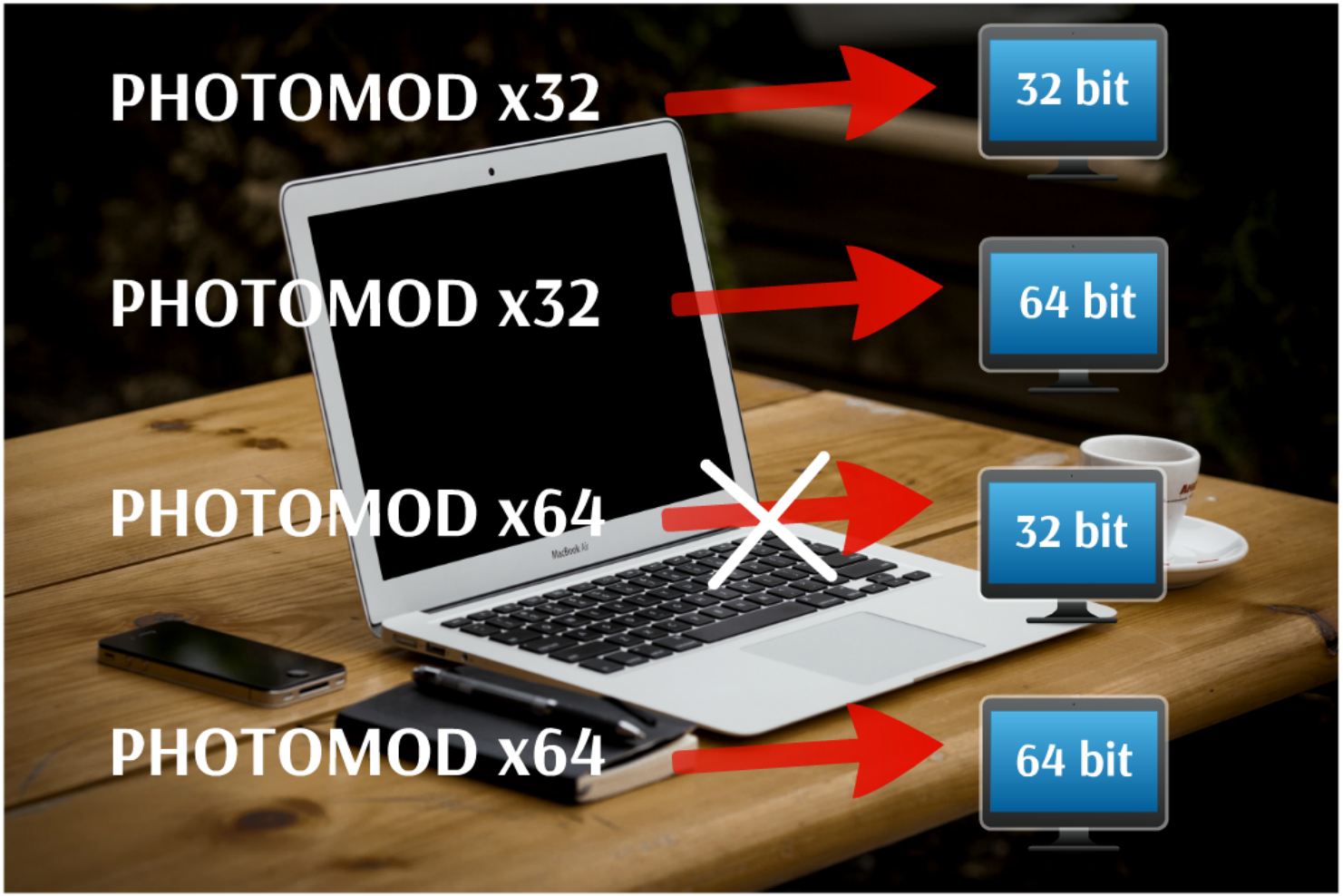
Prezi

RACURS

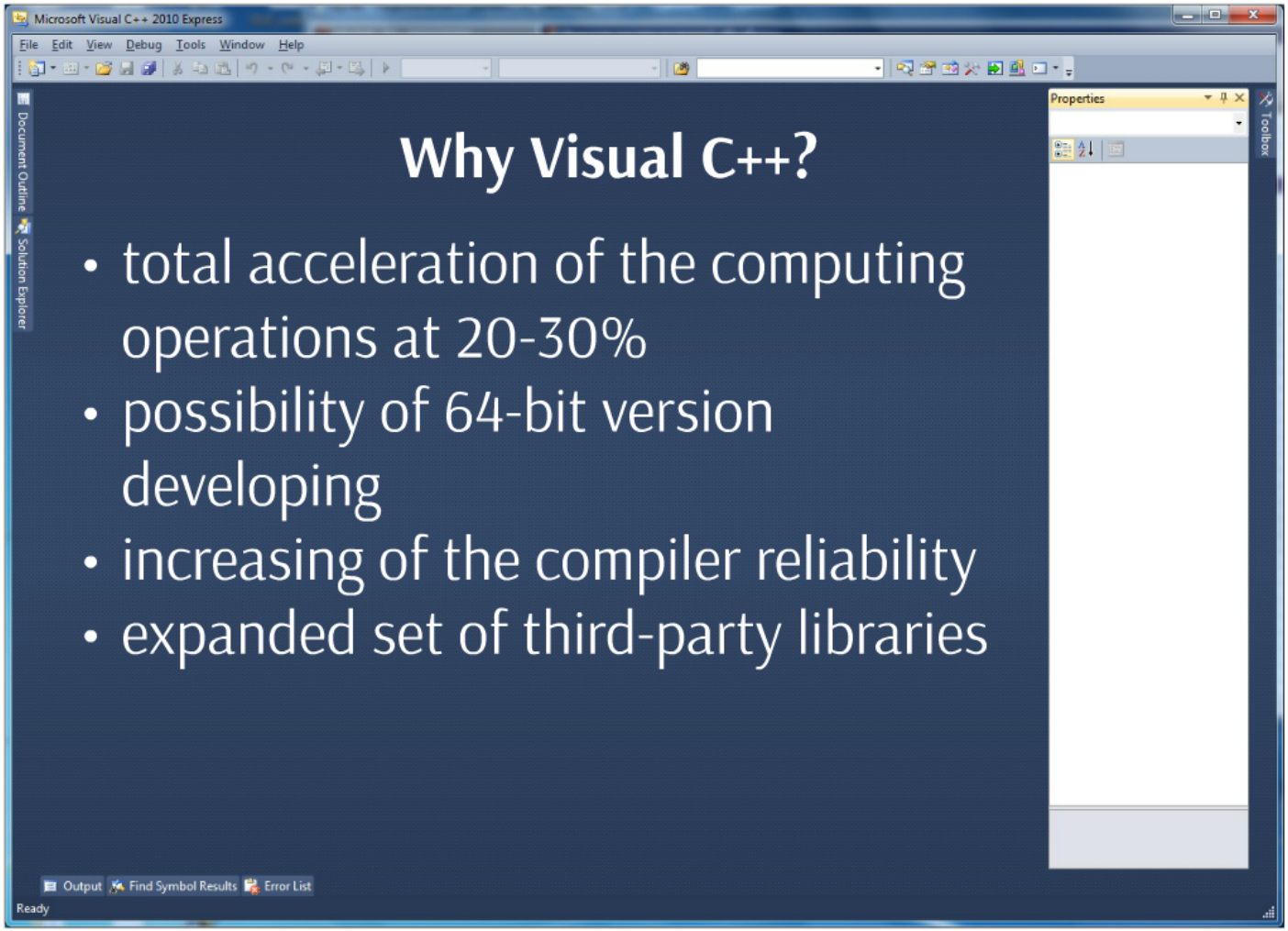


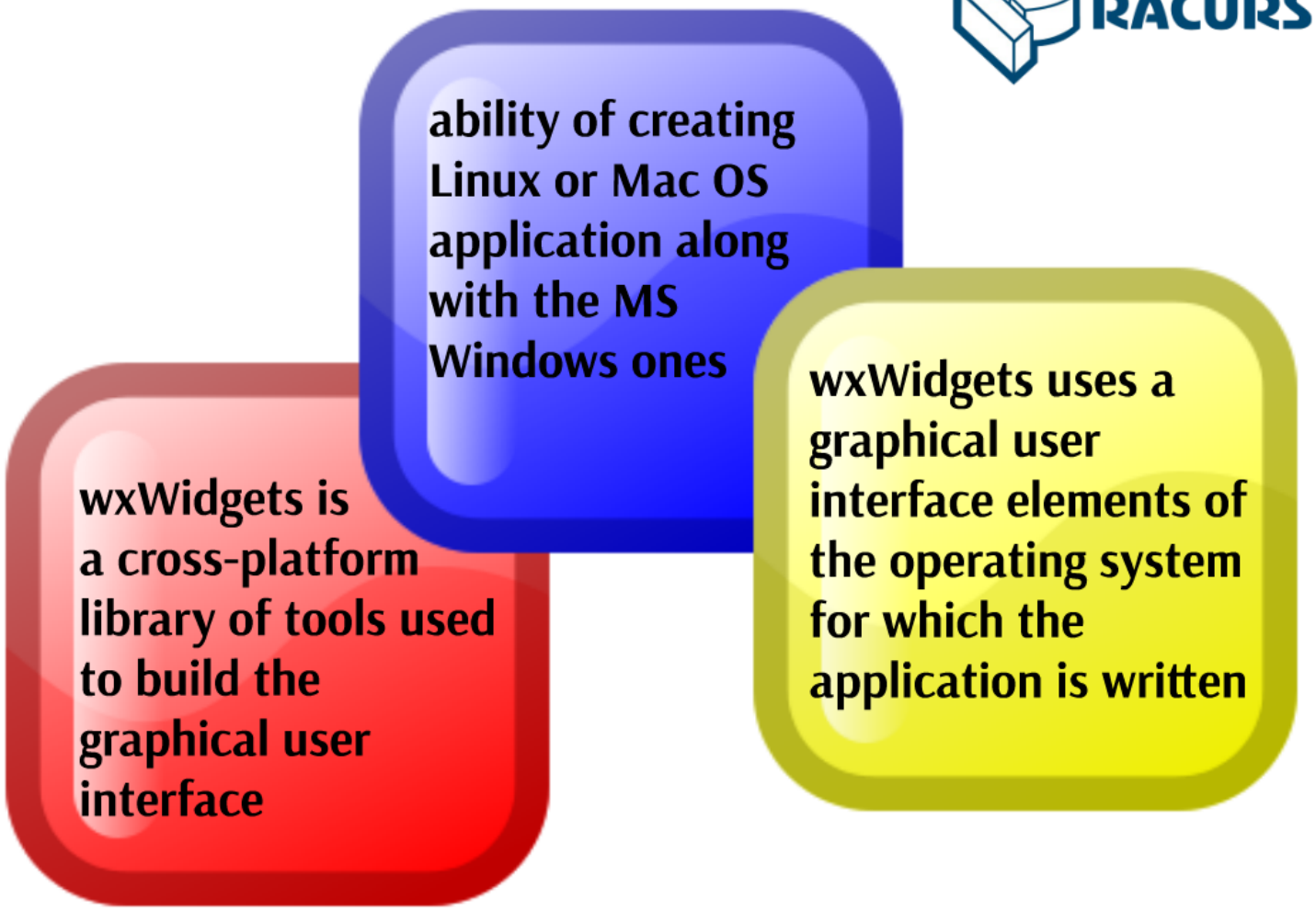

Prezi

RACURS



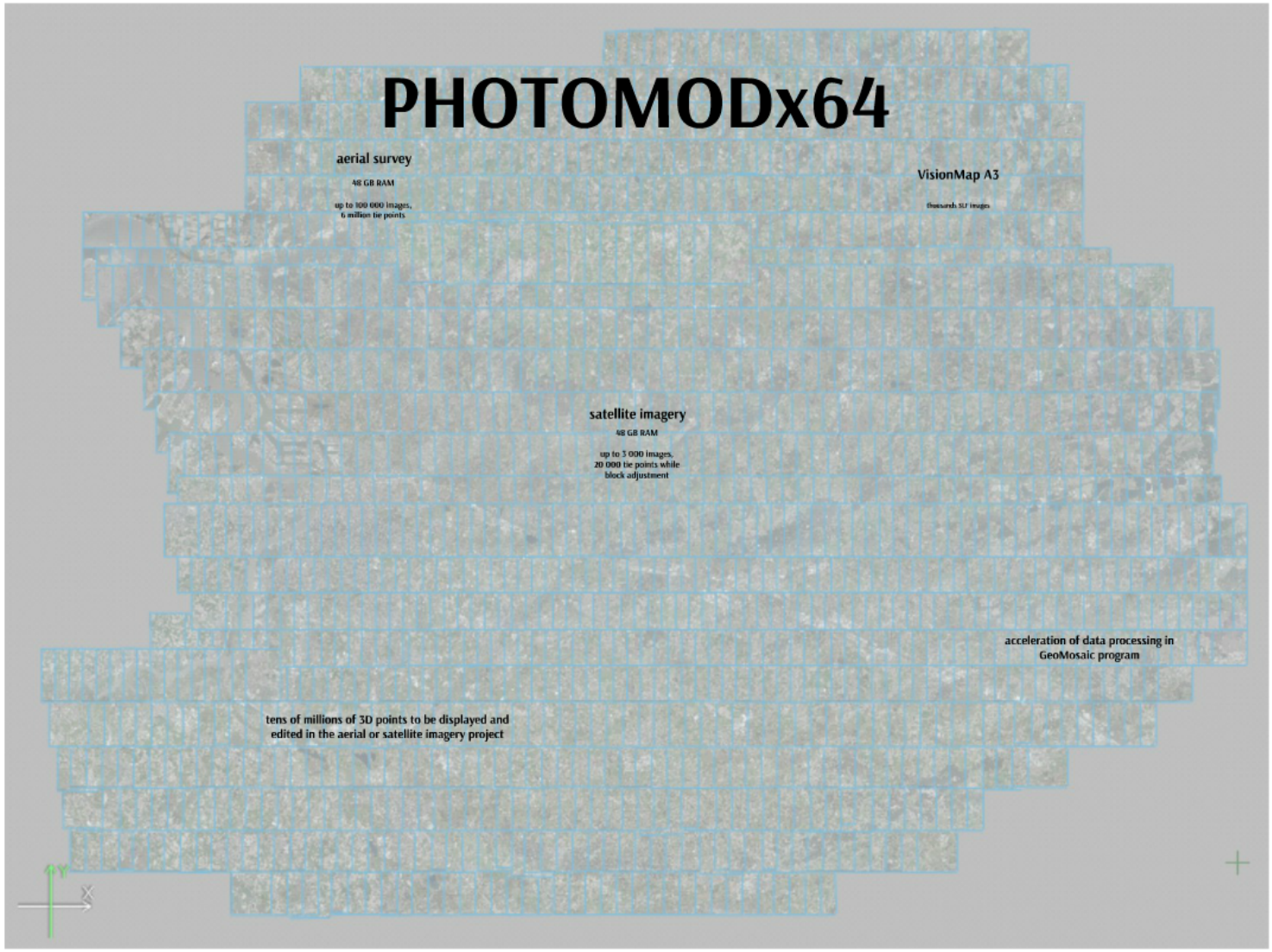

Prezi


Microsoft Visual C++ 2010 Express
File Edit View Debug Tools Window Help
Document Outline
Solution Explorer
Properties
Toolbox
Why Visual C++?
• total acceleration of the computing operations at 20-30%
• possibility of 64-bit version developing
• increasing of the compiler reliability
• expanded set of third-party libraries
Output
Find Symbol Results
Error List
Ready




# wxWidgets

Prezi


PHOTOMODx64
aerial survey
48 GB RAM
up to 100 000 images,
6 million tie points
VisionMap A3
thousands SLF images
satellite imagery
48 GB RAM
up to 3 000 images,
20 000 tie points while
block adjustment
acceleration of data processing in
GeoMosaic program
tens of millions of 3D points to be displayed and
edited in the aerial or satellite imagery project

# satellite imagery

## 48 GB RAM

## up to 3 000 images, 20 000 tie points while block adjustment

Prezi

# aerial survey

## 48 GB RAM

## up to 100 000 images,
## 6 million tie points

Prezi

# VisionMap A3

thousands SLF images

Prezi

tens of millions of 3D points to be displayed and edited in the aerial or satellite imagery project

Prezi

# acceleration of data processing in GeoMosaic program

Prezi

# Stages of the transition to 64-bit version of PHOTOMOD

Prezi

RACURS

1

# Separation of calculation modules and the interface

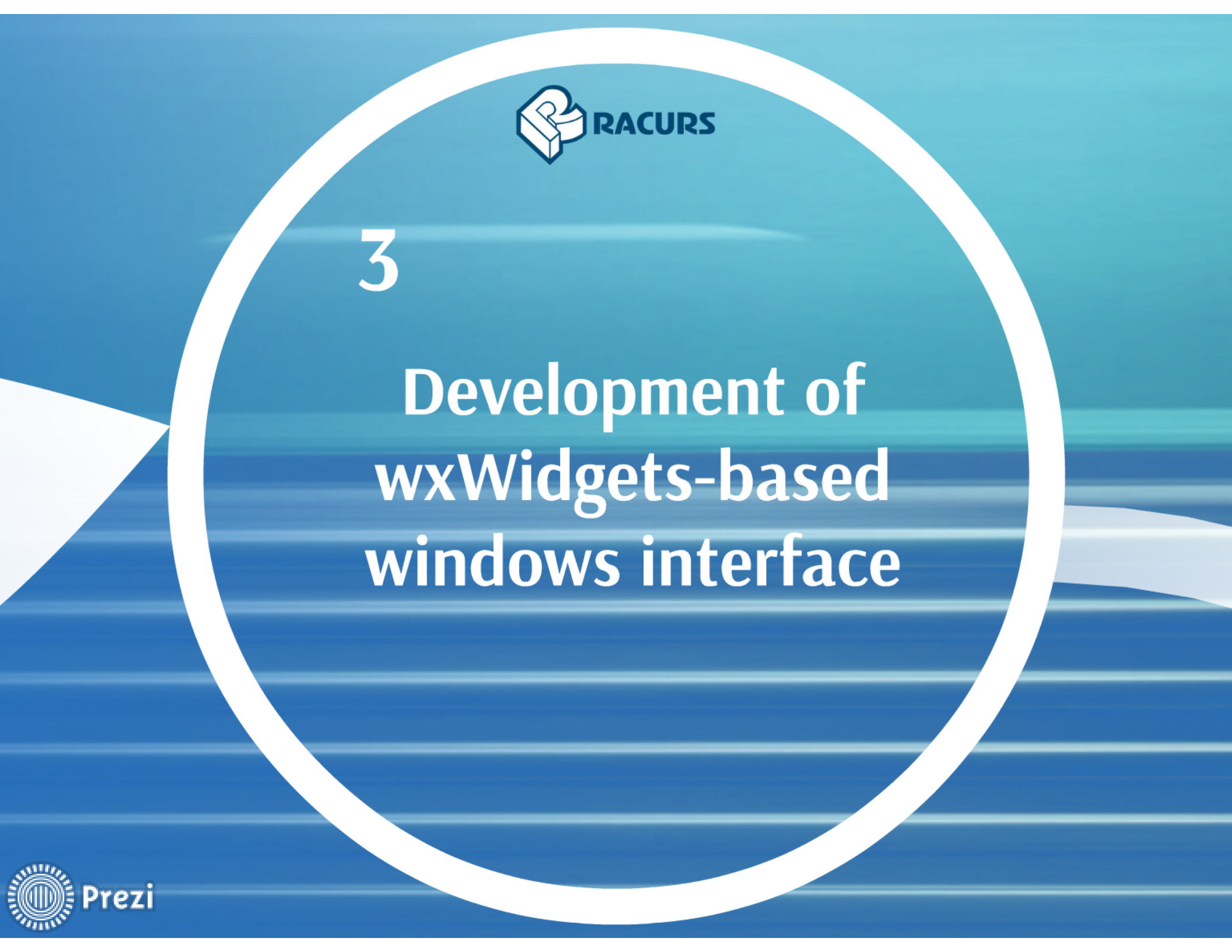
Prezi

RACURS

2

# Adaptation of calculation modules for the 64-bit version

Prezi


RACURS
3
Development of wxWidgets-based windows interface
Prezi

RACURS

4

# Adaptation of the interface for the 64-bit version

Prezi

RACURS

5

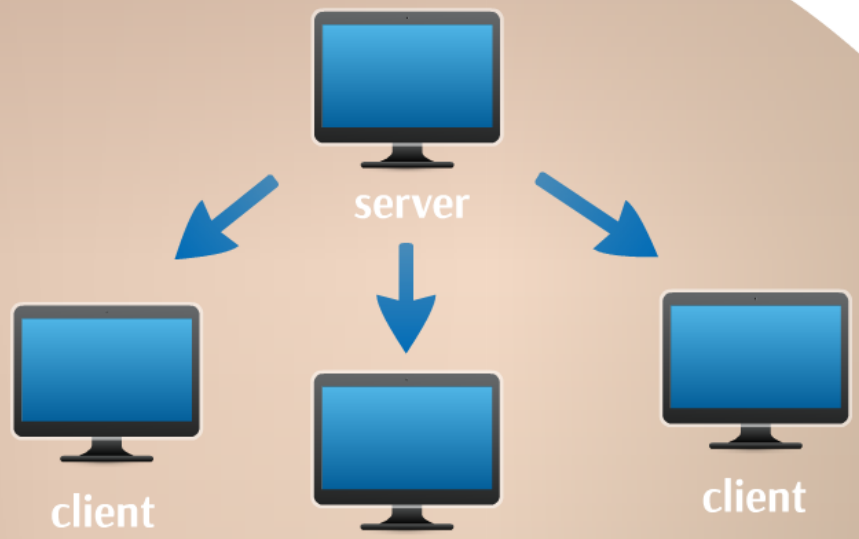
# Data processing optimization for 64-bit version

Prezi

RACURS
November 2014
PHOTOMOD x64 Release
July 2014
start testing of the full
PHOTOMOD x64 version
April 2014
intermediate version
PHOTOMOD x32 + x64 (5.3)
March 2014
distributed processing
tools for PHOTOMOD x64

Prezi

networking

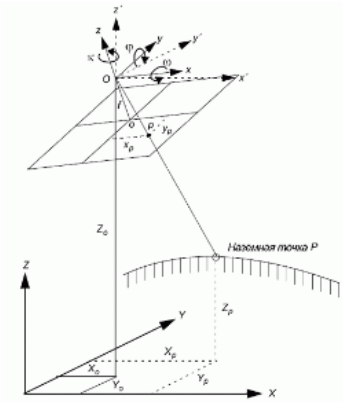



local work

number of tasks
=
number of
processor cores

server-client

Prezi



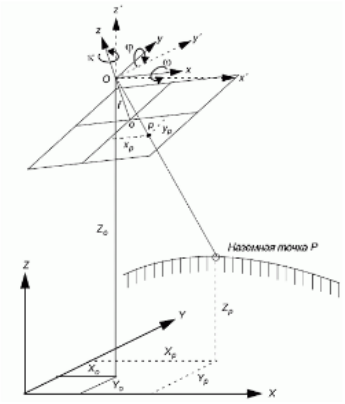
RACURS

# AT

## for aerial projects

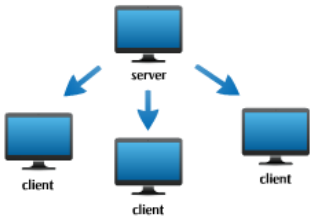
| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| triangulation points: 2 mln = 4 GB RAM; images: 10 000 | triangulation points: 2 mln = 4 GB RAM; images: 10 000; measuring more points in distributed processing mode | triangulation points: more than 2 mln = depends on the RAM; images: 100 000+ |

Prezi

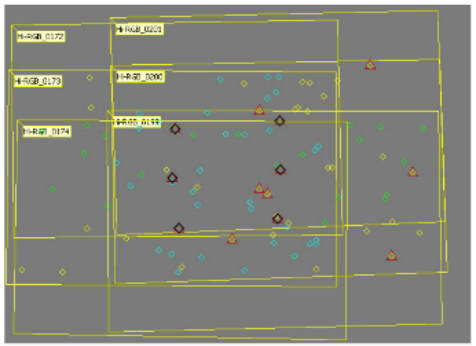


# AT

## for UAS projects

| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| "local" distributed processing (by using cores on one machine) |   real network distributed processing | acceleration of processes through the use of large amounts of computer memory |

Prezi



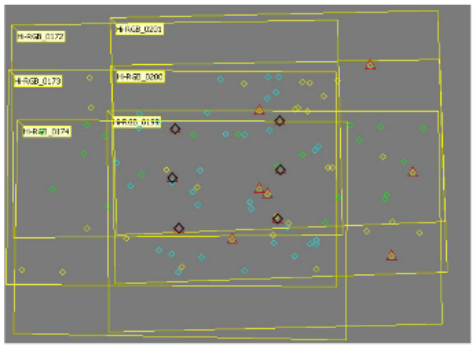
RACURS

# Solver

## for scanner satellite images

| PHOTOMOD x32 (5.25) | | PHOTOMOD x32 + x64 (5.3) | | PHOTOMOD x64 (6.0) | |
|---|---|---|---|---|---|
| triangulation points | images | triangulation points | images | triangulation points | images |
| 4500 = 4 GB RAM | 200 - 300 | 20 000 = 48 GB RAM | 3000+ | 20 000 = 48 GB RAM | 3000+ |

Prezi



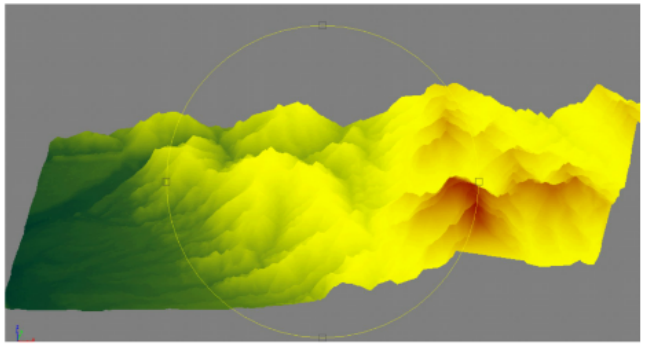
RACURS

# Solver

## for aerial images (central projection)

| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| present condition | present condition | • significant acceleration of the adjustment of UAS projects<br>• speeding up objects displaying |

Prezi



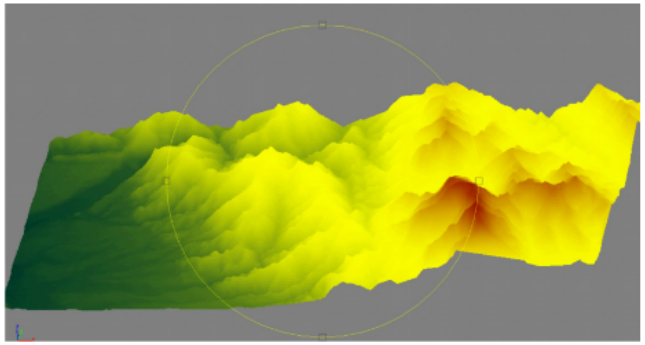
RACURS

# DTM

## for aerial and satellite imagery projects

| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| points<br>5 mln =<br>4 GB RAM | points<br>5 mln =<br>4 GB RAM | points<br>20 mln =<br>4 GB RAM or more<br>depends on the RAM |

Prezi



RACURS

# DTM

## for projects with lidar data

| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| points<br>450 mln = 4 GB RAM | points<br>450 mln = 4 GB RAM | points<br>depends on the RAM |

Prezi

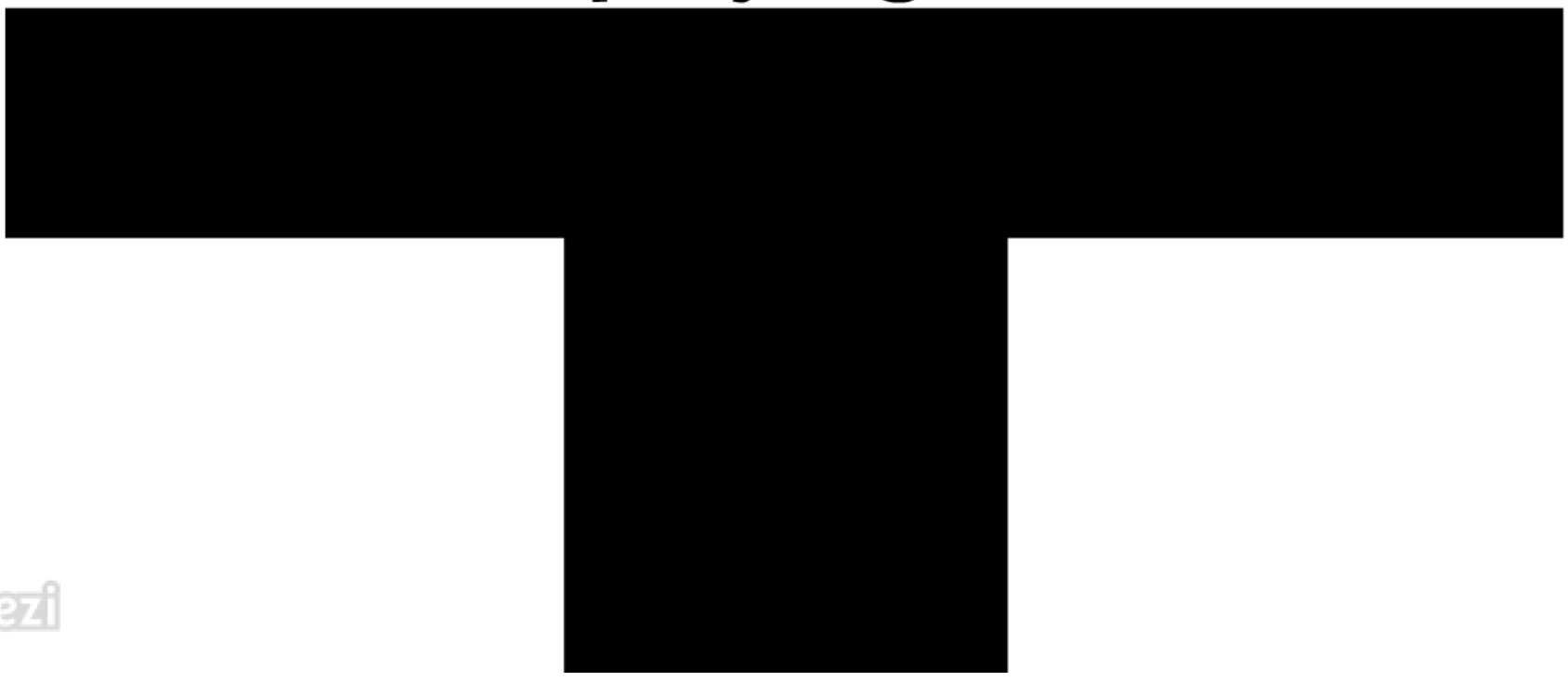
RACURS

# GeoMosaic

| PHOTOMOD x32 (5.25) | PHOTOMOD x32 + x64 (5.3) | PHOTOMOD x64 (6.0) |
|---|---|---|
| match histogram tool could not work in some cases because of the memory problem for big number of 16-bit images | ok for match histogram tool | total speeding up of displaying and significant increasing of number of source images |

Prezi

# General displaying acceleration



RACURS

# Hardware configuration

## PHOTOMOD 5.3 (Workstation)

| System Component | Recommended Configuration |
|---|---|
| CPU | Intel Core i7 |
| RAM | 4 GB |
| Graphics card | NVIDIA Quadro 2000 |
| HDD SATA | 1000 GB |
| OS | Microsoft Windows 7 x32/x64 |

Prezi

RACURS

# Hardware configuration

## PHOTOMOD 6.0 (Workstation)

10s of thousands images, 10s of millions vector objects in the project

| System Component | Recommended Configuration |
|---|---|
| CPU | Intel Core i7 |
| RAM | 24 GB |
| Graphics card | NVIDIA Quadro K2000 |
| HDD / SSD | 4000 GB |
| OS | Microsoft Windows 7/8 x64 |

Prezi

RACURS

# Distributed processing system

## computing unit

enclosure SBE-720E to 10 compute nodes (blades) with power supply, 10-Gigabit Ethernet Switch, CMM (Chassis Management Module), UPS

Prezi

RACURS

# Distributed processing system

## compute node (blade) - 20 cores

one core of the SBI-7127R-SH, containing:

- two processors with 10 cores - Intel® Xeon® Processor E5-2660 v2 2.20GHz
- 64 GB of memory
- SSD hard drive 200 GB
- two port network to 1 GB and two port to 10 GB
- one Windows server 2012 Standard

**So, if the enclosure put 10 of the blades, the system will contain 200 cores.**

Prezi

RACURS

# Distributed processing system

## compute node (blade) - 40 cores

one core of the SBI-7227R-T2, containing:

- four processors with 10 cores - Intel® Xeon® Processor E5-2660 v2 2.20GHz
- 128 GB of memory
- two SSD hard drive to 200GB
- two port network to 1 GB and four port to 10 GB
- two Windows server 2012 Standard

**So, if the enclosure put 10 of the blades, the system will contain 400 cores.**

Prezi

RACURS

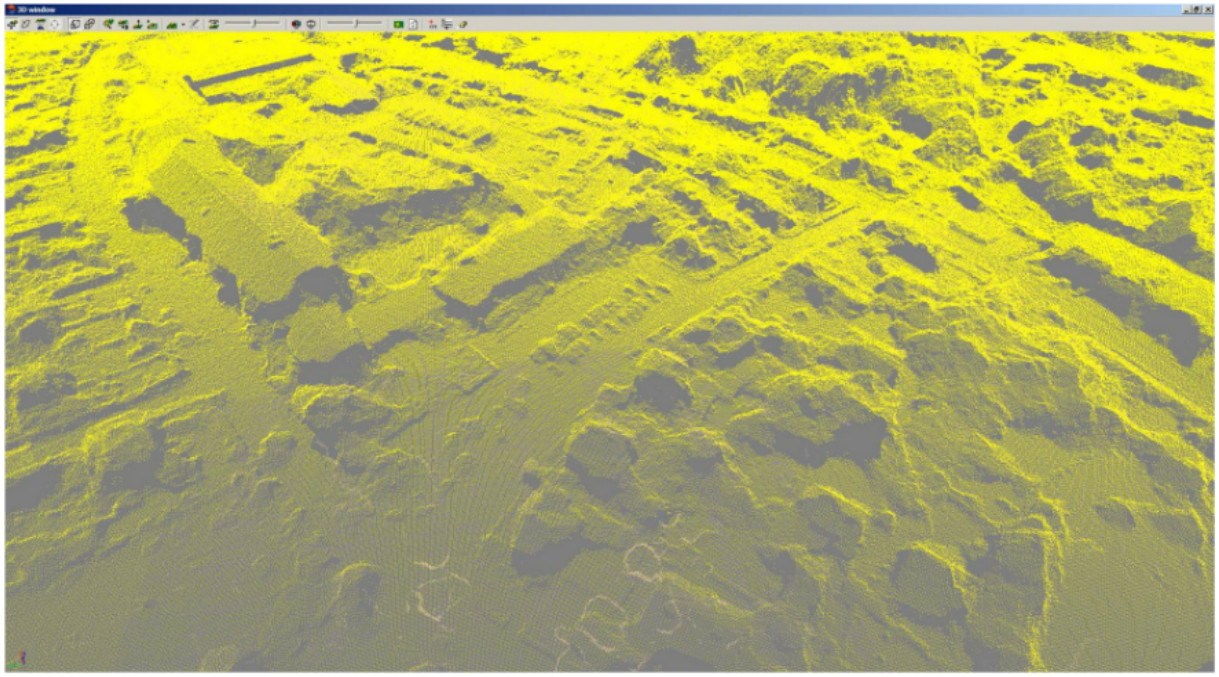
# Distributed processing system

## storage system

server:

- 32 TB of disk storage
- 16 TB SSD memory
- two 6 core Intel ® Xeon ® Processor E5-2620 v2 2.10 GHz
- 128 GB RAM
- two port network to 10 GB

Prezi



50 million 3D points loaded into PHOTOMOD 6.0 3D window

RACURS

# PHOTOMOD UAS 6.0

- stand-alone full photogrammetric UAS-oriented software
- simplified user-interface
- distributed UAS triangulation
- improved self-calibration procedure
- speeding up of block adjustment
- corellator modifications

## What is upcoming?

- closer to one-button solution
- 3D block layout
- more speeding up
- special tools for curtain shutter particularities
- block “sub-sampling” by more complicated criteria
- automatic GCP recognition
- oblique imagery processing (3D modeling)

Prezi

# Thank you for attention !

See you at Master class 22 october!

Prezi