

Outline

- 1 Basic info
- 2 Previous education
- 3 Promotion research



Basic info

Name: Albert-Jan Yzelman
Started: September 2007
Age: 23
Hometown: Duiven (near Arnhem)
Supervisor: Rob Bisseling
Research area: Combinatorial Scientific Computing

Hobbies: Music, Anime, Pool,
Games, Reading, Movies,
Photography



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Education

- High school, Duiven, 2001
- BSc. Computing Sciences, Utrecht, 2007
- BSc. Mathematics, Utrecht, 2007
- MSc. Scientific Computing, Utrecht, 2007



Bachelor's thesis

Radiosity;

- Uses physical relations for energy transmission for global illumination
- Subdivide surfaces into equally-sized squares
- Derive a linear system $Ax = b$ to calculate the brightness of each square
- Solve this system in parallel





Figure: Sample radiosity-rendered scene. Size of the *dense* matrix A is $7 \cdot 2^6 \times 7 \cdot 2^6$; thus holding over 200000 elements.

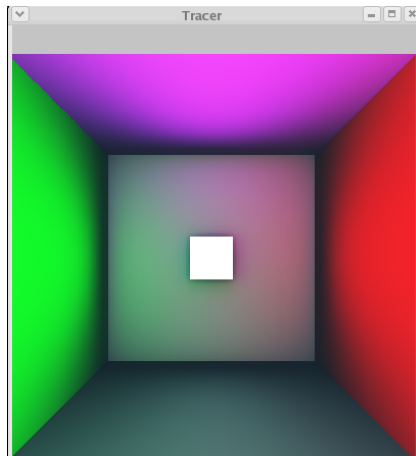


Figure: Sample radiosity-rendered scene. Size of the *dense* matrix A is $7 \cdot 2^{14} \times 7 \cdot 2^{14}$; thus holding over 13 million elements.

Master's thesis

R-tree project

- Internship at Alten Nederland, a technical consultancy group

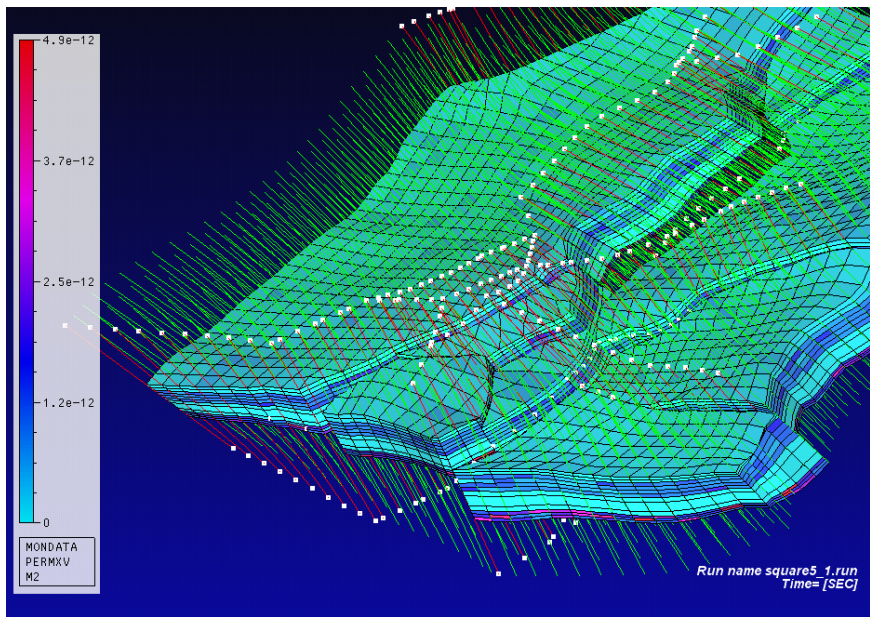


Master's thesis

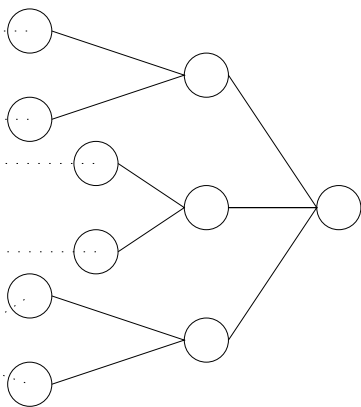
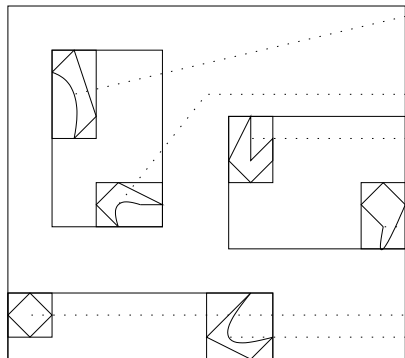
R-tree project

- Internship at Alten Nederland, a technical consultancy group
- Improve data access and storage efficiency of Shell's oil reservoir simulation software





What are R-trees?



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Combinatorial Scientific Computing

Supports the more general area of Scientific Computing by researching common problems such as:

- Load balancing
- Mesh generation
- Sparse matrix operations

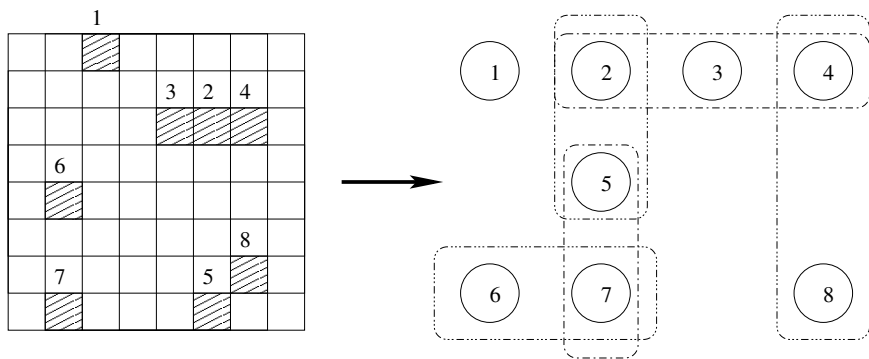


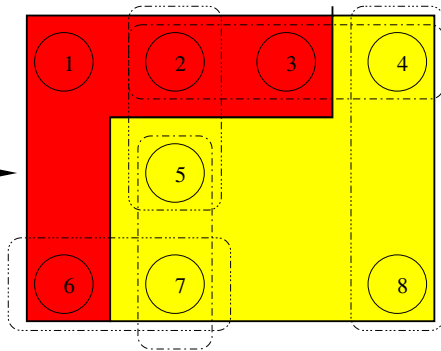
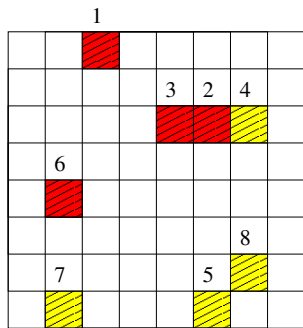
Combinatorial Scientific Computing

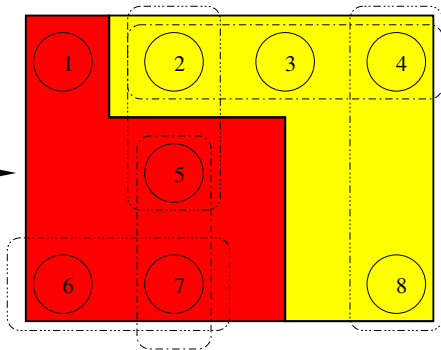
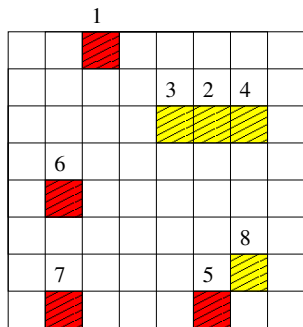
The matrix partitioner *Mondriaan* (by Rob Bisseling) will be enhanced and applied on secondary problems;

- Less communication in sparse matrix computations
- Clustering
- Improving cache efficiency during matrix computations









Combinatorial Scientific Computing

Clustering is certainly one of the more interesting subjects, due to its many possible applications, including:

- Genomics; mapping DNA chromosomes to hereditary diseases
- Finding densely linked webpages (web spam, improving search engines)

