

UNIVERSITY OF TWENTE.

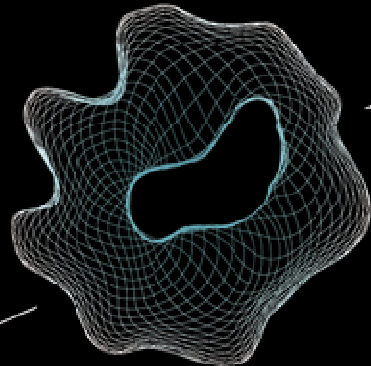


# VERIFICATION OF CONCURRENT DATA STRUCTURES

**VERCORS**

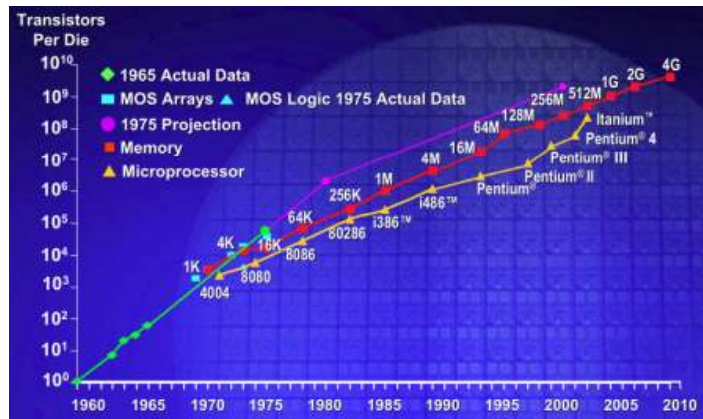
MARIEKE HUISMAN

22ND OF APRIL, 2010

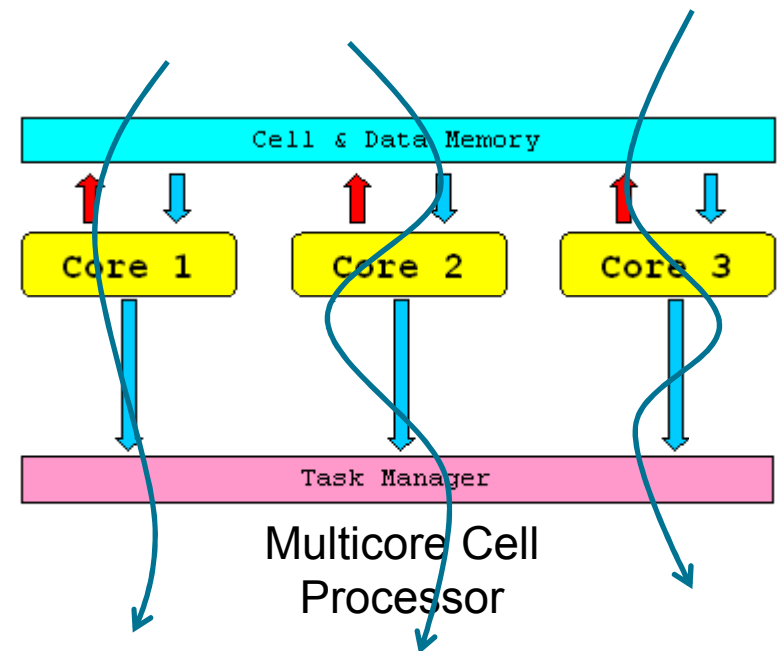


# THE FUTURE OF COMPUTING IS MULTICORE

Single core processors:  
**The end of Moore's law**



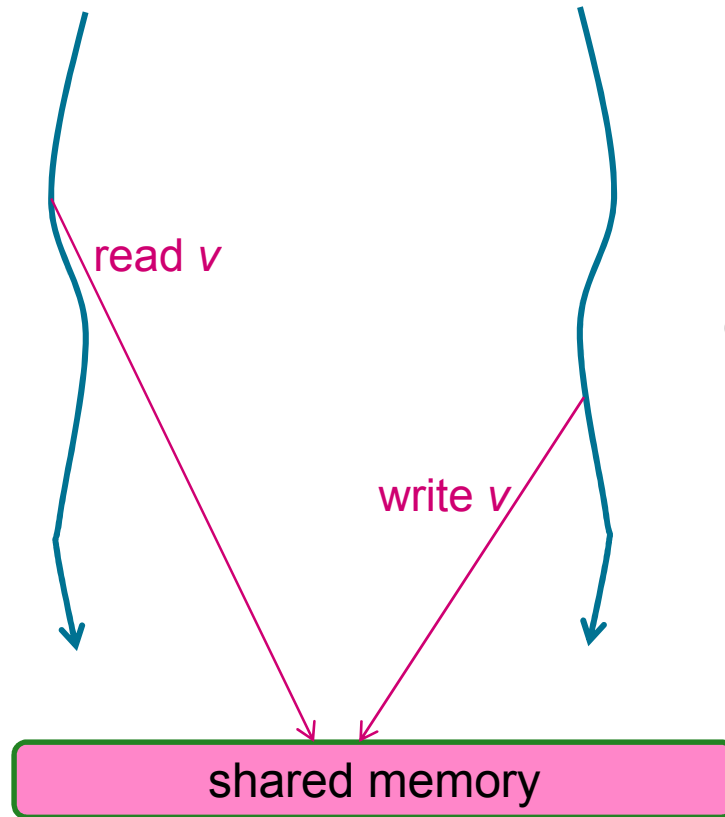
Solution:  
**Multi-core processors**



**Multiple threads of execution**

**Coordination problem shifts from hardware to software**

# MULTIPLE THREADS CAUSE PROBLEMS



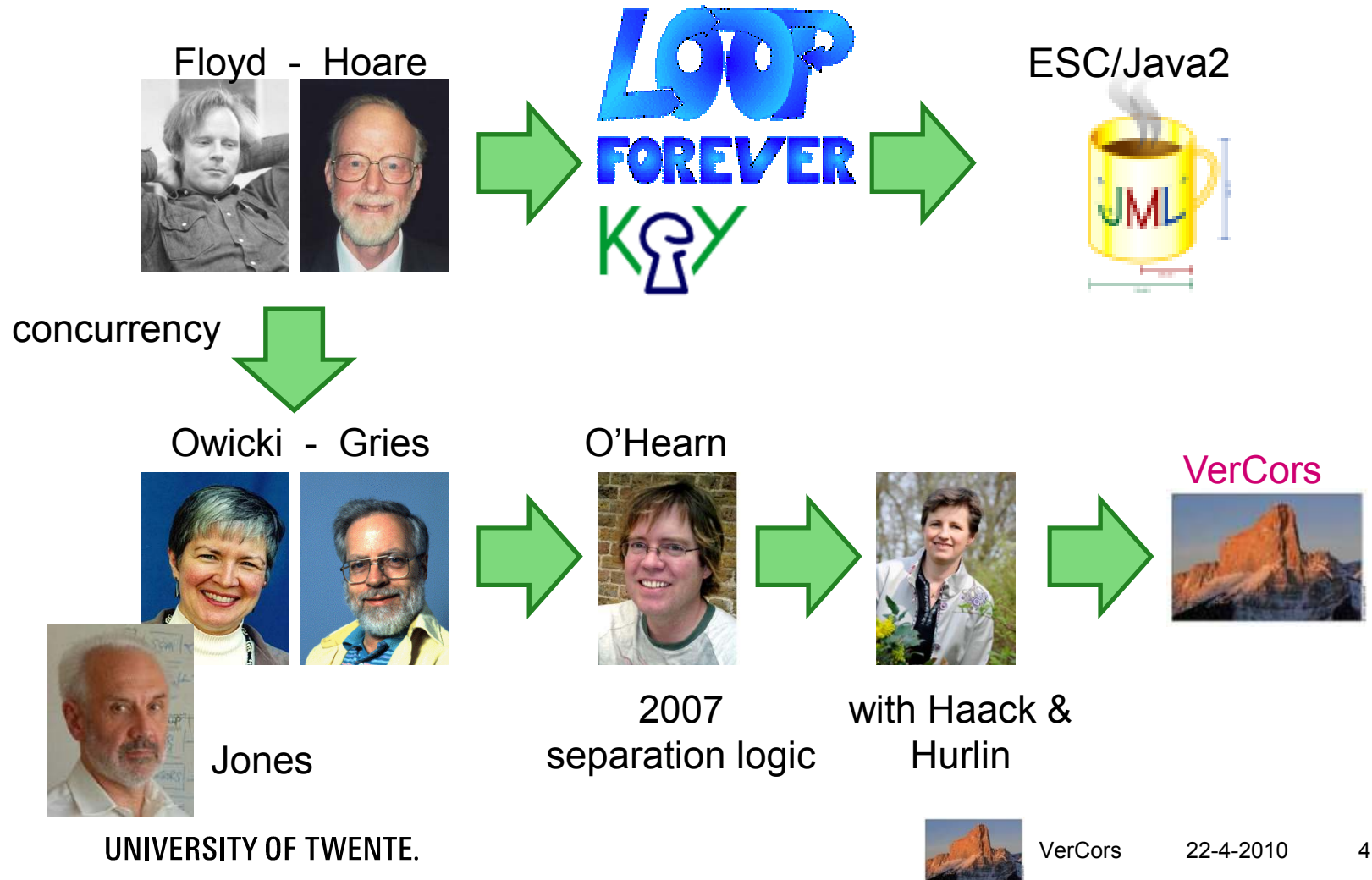
- Order?
- More threads?



Possible consequences:  
errors such as data races caused  
lethal bugs as in Therac-25



# PROGRAM LOGICS CHASE BUGS

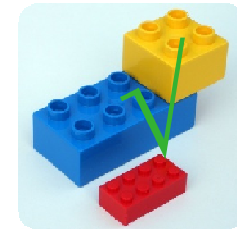


# WHAT WILL BE NEW IN VERCORS?

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## Automated verification of concurrent software

- Collection of verified concurrent data structures
- Generic verification theory of concurrent programming
  - Different concurrency and synchronisation techniques
  - Allows to change locking policy
  - Different programming languages
- Automation
  - Decision procedures for proof obligations
  - Generation of specifications



# SUCCESS FACTORS VERCORS

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## Experienced researcher

Expert in area of

- program verification



- concurrency



Successful in supervision



and others...

## Now is the time

- Theory is maturing
- Multicore is omnipresent
- Practical usability in reach

## Guaranteed dissemination



- Collaboration with tool builders for sequential programs

- High demand for results
- Good contacts



# OBJECTIVES VERCORS

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Automated verification of  
concurrent software

