Bremen

CG
VR

Massively Parallel Algorithms
Organisational Stuff

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What You (Hopefully) Get Out of This Course

- Most importantly: *mind set* for thinking about massively parallel algorithms
- Overview of some *fundamental* massively parallel algorithms
- Techniques for massively parallel *visual computing*
- Awareness of the *issues* (and solutions) when using massively parallel architectures
- Programming skills in *CUDA* (the language/compiler/frameworks for programming GPUs)

Prerequisites

- Some programming skills in C/C++
  - In order to solve the exercises
  - Actually, C++ is not really needed
  - But the concept of *pointers* should be familiar
- Algorithmic thinking (and, hopefully, some pleasure when thinking about algorithms)

- *Not* required are:
  - Experience with parallel programming
  - Experience with computer graphics

Is This Course For Me ???

- This course is not for you ...
  - If you don’t like algorithms
  - If you are not ready to do a bit of programming in C
  - If you're not open to thinking about computing in completely new ways

Otherwise ...

- It will be a richly rewarding experience!

Website

- All important information about this course can be found on:

  http://cgvr.informatik.uni-bremen.de/

  → "Teaching" → "Massively Parallel Algorithms"
- Slides
- Assignments
- Text books, online literature
- Please sign up in StudIP!

Abstimmung: Modus der Vorlesung

- Jeden Montag 2 Doppelstunden (10 — 14 Uhr)
  bis Ende Dezember → 3 SWS
- Beginn: 10 ct
- Abstimmung:
  1. Alle 180 Minuten (= 3h) in einem Stück (Ende = 13:15)
  2. 2x 90 Minuten mit 15 Minuten Pause dazwischen (Ende = 13:30)
  3. 3x 60 Minuten mit 5 Minuten Pause dazwischen (Ende = 13:25)
  4. Weitere Varianten? ...

The Exam

1. Either: full oral exam (ca. ½ hour per student)
2. Or: grades from the exercies + "Fachgespräch"
   - Exercises → grade A , Fachgespräch → grade B
     - 95% of all points of the exercises → grade A = 1.0
     - 40% of all points of the exercises → grade A = 4.0
   - Overall grade = $0.5 \times A + 0.5 \times B$
   - Precondition: grade A ≥ 4.0 && grade B ≥ 4.0 !
     (Allgemeiner Teil der Bachelorprüfungsordnungen der Universität Bremen, 2010)

- Grading criteria of the exercises:
  1. Labeling variable and function names
  2. "Sufficient" comments in body of functions
  3. Documentation of functions and their parameters (in/out, pre-/post-condition, what does the function do / not do, ...)
  4. Functionality (exercise solved? no bugs? ...)

Ihre Übungsgruppenleiter

Fariba Mostajeran
Ü.gruppe in Englisch
Tuesday 8-10

Jan Wieferich
Dienstag 16-18

Daniel Mohr
Dienstag 8-10 & 16-18

Exercises / Assignments

- Weekly small exercises until middle of May
  - Due the week after assignment
- Your own programming project during the rest of the semester
  - Due in the last lecture!
  - You give the demo ...
  - Before you begin, you need to present your idea in 5 minutes

The SDK, Needed for Working at Home

- IDE (obviously) of your choice
  - Can be as simple as an ASCII editor and compiler on command line
- CUDA for your platform:

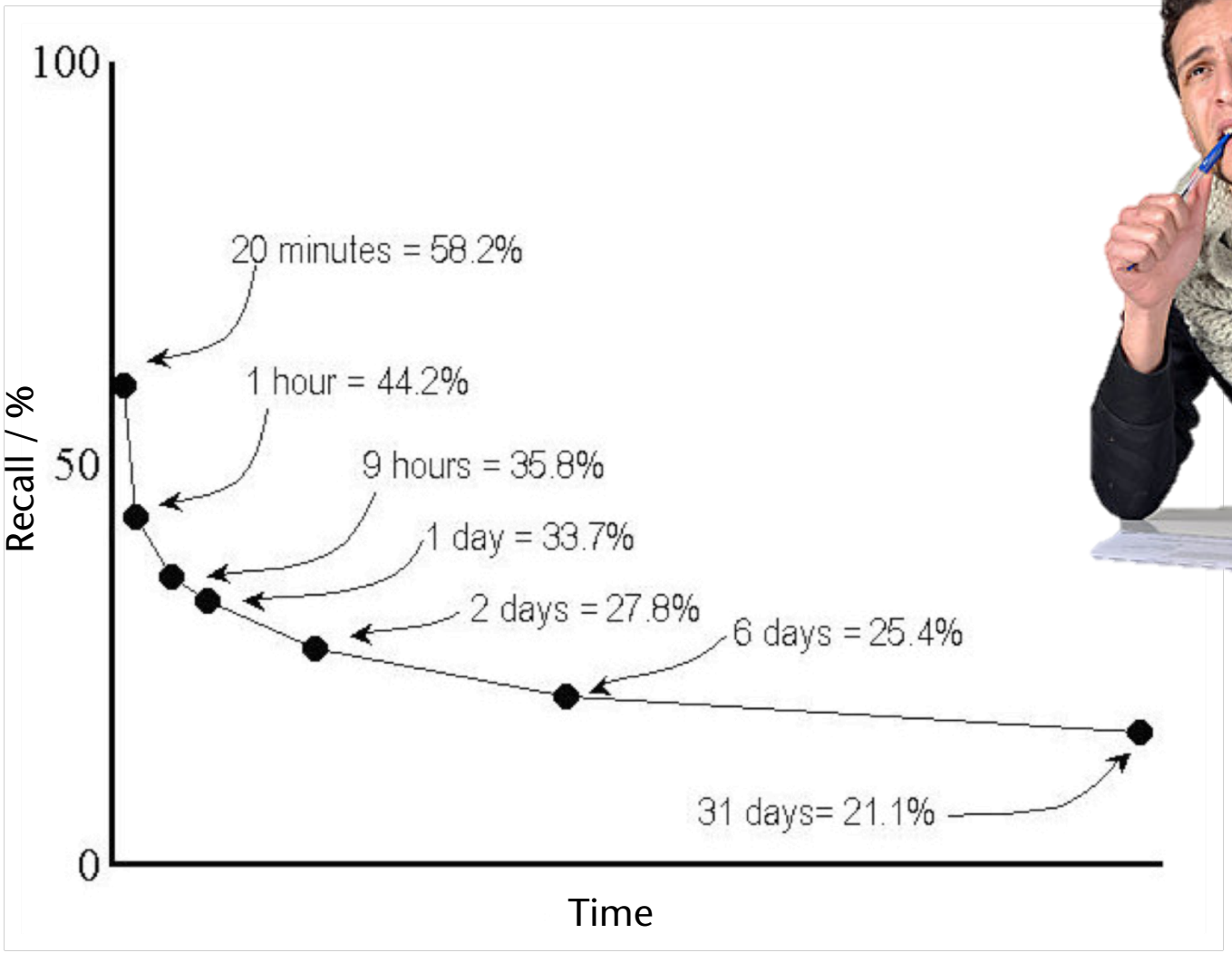
  https://developer.nvidia.com/cuda-downloads
  - Works, of course, only with NVidia graphics cards
  - If your laptop/desktop does not contain NVidia, use the pool or our lab

A Quote

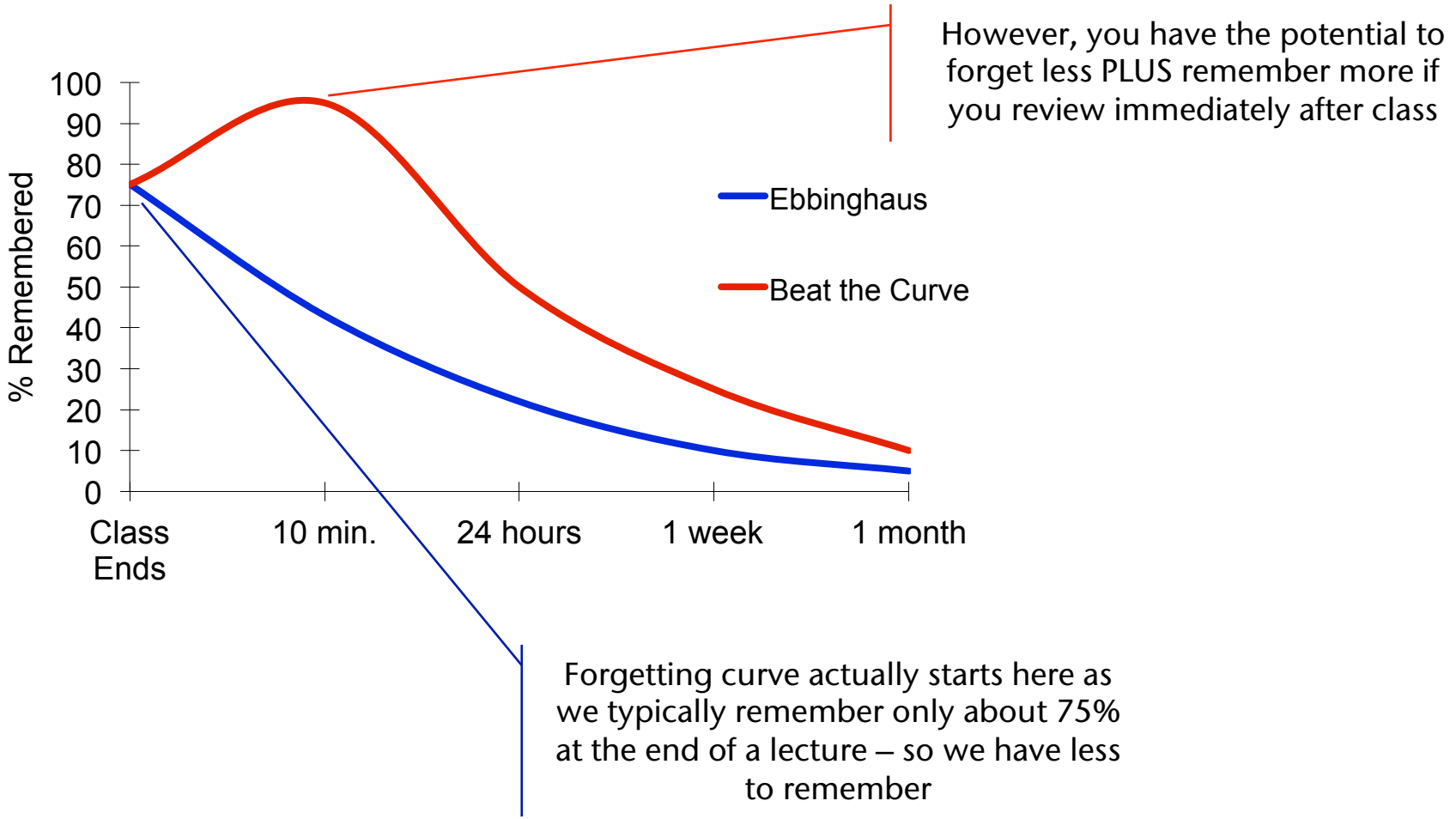
I hear and I forget.
I see and I remember.
I do and I understand.

[attributed to Confucius]

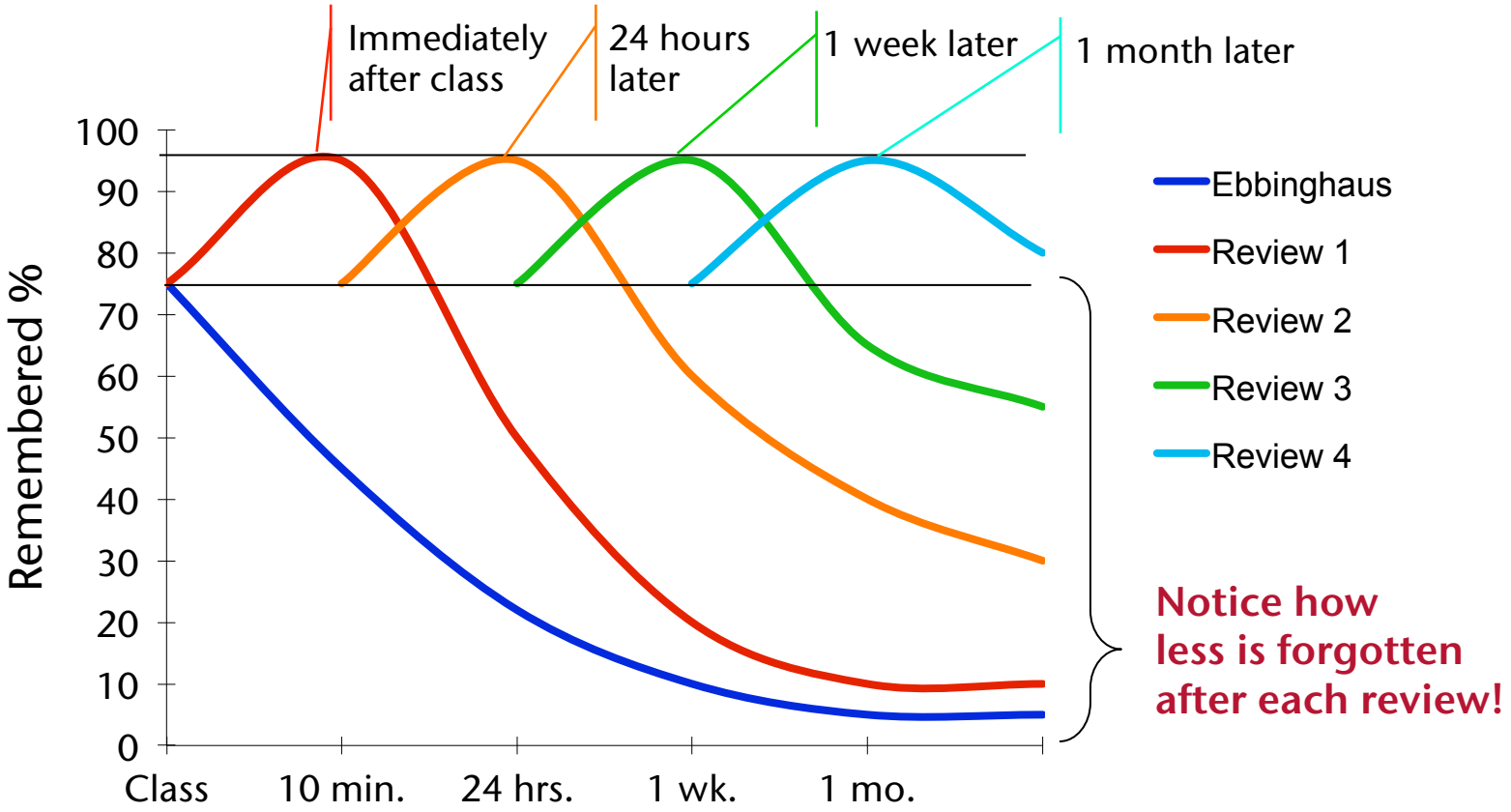
The Forgetting Curve (Ebbinghaus)



Beating the Forgetting Curve



Overcoming the Curve



Average Retention Rates

Just listening	5%
Reading	10%
Audio Visual	20%
Demonstration	30%
Discussion	50%
Practice by doing	75%
Teach others	90%


Source: Principles of Educational Multimedia User Interface Design
Dr. LAWRENCE J. NAJJAR, Georgia Tech Research Institute, Atlanta, Georgia
speaking +
relevant image
= 65% recall
after 72 hrs

Literatur