book proposal

www.cs.vu.nl/∼eliens/media/proposal.html

original version: 26/5/2003
last update: 25/4/2005 second revision of the manuscript
update: 4/4/2005 first revision of the manuscript
update: 5/2/2005 (answers to reviewers remarks)
update: 18/12/2004 (additional comments)
update: 10/11/2004 (modified outline)
update: 5/10/2004 (additional information)
online material – www.cs.vu.nl/∼eliens/media
manuscript (pdf) – www.cs.vu.nl/∼eliens/media/pdf/doc.pdf

title: introduction multimedia

author: A. Eliëns

status: complete manuscript (but see *proposed enhancements*)

In the light of the envisioned enhancements of the manuscript a suitable (working) title might be: ***an introduction to multimedia authoring***.

the book

From the preface:

> *This book provides a concise and comprehensive introduction to multimedia. It arose out of the need for material with a strong academic component, that is (simply) material related to scientific research.*
>
> *The themes and variations addressed in this book may be summarized as follows.*

themes and variations

- digital convergence
- broadband communication
- multimedia information retrieval

> *To explain in somewhat more detail,* digital convergence *may be characterized as the coming together of data (including audio, video and information) in a possible multitude of platforms, to which these data are delivered by a variety of (broadband) communication channels. In fact, the increasingly powerful communication infrastructure due to the popularity of the Internet and the World Wide Web, leads to an almost universally accessible multimedia (information) repository, for*

which (unfortunately) the notion of (multimedia) information retrieval seems to have occurred only as an afterthought.

An underlying thought that motivated the writing of this book is that somehow the gap between authoring *and* retrieval *should be bridged. In other words, either by developing the technology for extracting features or attributes from multimedia objects, or by applying content annotation for such objects, multimedia information retrieval should be considered as a necessary asset to make a multimedia web an effective information repository.*

This book aims at giving a concise introduction to multimedia, covering the themes mentioned above. It can be used either for self-study or as material for presentation in class. In the book an overview is given of concepts and technology that are present in multimedia practice and research. In addition, numerous hints are given for further reading, research and student projects.

brief history:

I started developing the course notes for the course Introduction Multimedia in the beginning of 2000. I used Principles of Multimedia Databases then as a book. But I was dissatisfied with the course, and decided to develop my own material. After presenting that in class, I decided to write the book, since the idea of it had grown over a period of almost two years.

The original title of the manuscript was *A (not so) gentle introduction to multimedia*, which might sfter all still be a suitable title when the book is taken into production.

features

- The material is available online, and includes a presentation-ready 'slide format' See below.

- A distinct advantage of the book, over the competition, is that it is short. The text will not exceed 150-200 pages. Any of the other books is 400-500 pages, at least. In my experience, no student has the patience (nor the ability) to read that all.

- Although the book is meant for first year students, it is not limited to that audience. The level of the students is of more importance when considering how to take the exam. The text contains sufficient references to other material to be user for higher level students, or even research students and professionals. To assist the instructor, a number of questions are included (organised wrt. insight, conceptual knowledge, and detailed knowledge of technology and facts). To assist students in learning the material, there are (online) backlinks from the questions to the relevant portions of the text. There is also a sample of lectures, with a brief explanation.

- Since the course, as I taught it, also included a practical assignment, the online version contains a manual for Macromedia Director, in the same format as the text.

- For each section a *research directions* section is included, discussing topics for further reading or projects.

The book collects material from a variety of sources. The authors own research is only discussed in chapter 7, and some parts of chapter 6. Also included are a number of research directions sections, these provide suggestions for projects and future research.

The suggested lectures do not all follow the linear structure of the text, but may take parts at will. For example, with an eye on the practical assignments, section 2.3 will usually be dealt with before discussing chapters 1 or 2 in any detail.

In summary: The book offers a concise (approx. 150 pages) introduction to multimedia, a field that is gaining academic interest rapidly. It fills a gap in the existing literature, by giving a broad overview and references to research and development in the areas of interest. It provides online material (including powerpoint presentations) to assist the instructor in presenting the course and allowing students to explore further references. It has a distinct style, that meets academic standards.

slides format Using my experience in writing the OO book, I again adopted the so-called 'slides' as a means to take text from the book for presentation. Let me explain that in somewhat more detail: a slide is a piece of text, a list, table or figure, that (using some tools) is taken out of the text and presented. The advantage of this approach is that the relation between slides and the text is immediate, which is not the case with other presentation formats. In contrast with the OO book, however, where the slides were made explicit by boxes in the text, I now use an implicit slide mode, to allow for more continuous text. The use of slides is, however, reflected in the text by what may be called a graphical or short hand style, using layout and brief bulleted phrases instead of long passages of text.

background

A full CV is available at: www.cs.vu.nl/∼eliens/cv/cv.html

previous titles of the author:

- DLP – A language for Distributed Logic Programming, Wiley (1992)
- Principles of Object-Oriented Software Development, Addison-Wesley (2000), 2nd edn. (translated in russian and chinese)

(research) experience of the author: I have been doing research in multimedia information retrieval and virtual environments (partly as a guest at the dutch

research institute CWI), for a period of over four years. This research is reflected in the book, notably chapter 7 and in some of the 'research directions' parts in the other chapters.

courses taught by the author:

- introduction multimedia
- multimedia authoring I – Web3D/VRML
- multimedia authoring II – Virtual Environments
- multimedia casus – applied practicum
- visual design, since februari 2005
- in the past: Object Oriented Software Development
- in the past: Formal Methods

competition

There are a number of other books in the field that might qualify as a book for the kind of course my book is intended for. Comments are given in shorthand,

Multimedia – Making It Work

+ used at Univ of Amsterdam
- unwieldy, colloquial, sub-academic

Dust or Magic

+ nice, lot of feeling for the field
- chaotic, full of cheap advice to the 'talent', sub-academic

Principles of Multimedia Databases

+ excellent, highly academic, good ideas + formalization
- too database oriented (SQL), too many technical details, too much irrelevant material

Understanding networked multimedia

+ broad coverage, well-structured, reasonably well written
- too technical, too much material, slightly outdated

Handbook of Multimedia Information management

+ good material, in-depth
- collection of articles, difficult to adapt for presentation

The Computer in the Visual Arts

+ well-written, from artist's viewpoint
- too narrow, and too many details

Digital Multimedia

+ broad coverage, well-illustrated
- interesting but lengthy explanations

Digital Media Tools

+ extensive explanation of representative tools
- limited choice of tools, rather lengthy

Fundamentals of Multimedia

+ broad coverage of technical issues
- for technical computer science only

All these are 500 pages+ books. Principles of Multimedia Databases has ample additional material for educational purposes. Chapman and Chapman (Digital Multimedia & Digital Media Tools) give suggestions for student projects. And Fundamentals of Multimedia as recommeded exercises with each chapter.

The Chapman and Chapman books (both 500+ pages) are primarily directed towards the layman and beginning information science students. They provide a non-technical coverage of many issues is digital content creation and deployment, including technical factors that may influence the design of digital content. In opposition, Fundamentals of Multimedia is meant for students of computer science with a strong interest in technical issues of multimedia formats, coding and compression and networking.

My own proposal may be positioned midway, with respect to these two approaches. Is is meant for both (beginning) information science and computer science. It does include expositions of a more technical nature, but leaves the details to the references provided (many of which are online). It has no explicit coverage of the use digital media tools but (with the envisioned additions) is meant to give sufficient information on the choice of tools and technologies. Moreover, a topic lacking in both approaches is a treatmeant of (modern) game technologies such as DirectX which provide a platform for multimedia content creation and delivery. See *proposed enhancements*.

In comparison, in the same brief way I could characterize my own proposal: introduction multimedia

+ concise, broad overview, excellent thematic focus
- sometimes cryptic, requires study of (online) references

references

Making T. Vaughan, *Multimedia – Making It Work,* Osborne/McGraw-Hill, 1998 4th edn

Magic B. Hughes, *Dust or Magic – Secrets of Successful Multimedia Design,* Addison-Wesley, 2000

MMDBMS V.S. Subrahmanian , *Principles of Multimedia Databases,* Morgan Kaufmann, 1998

Networked F. Fluckiger, *Understanding networked multimedia – applications and technology,* Prentice Hall, 1995

Handbook W. Grosky, R. Jain, R. Mehrotra (eds), *The Handbook of Multimedia Information Management,* Prentice Hall, 1997

Computer A.M. Spalter, *The Computer in the Visual Arts,* Addison-Wesley, 1999

Multimedia N. Chapman and J. Chapman, *Digital Multimedia,* Wiley 2004 (2nd edn.)

Tools N. Chapman and J. Chapman, *Digital Media Tools,* Wiley 2004 (2nd edn.)

Fundamentals Z-N. Li and M.S. Drew, *Fundamentals of Multimedia,* Prentice-Hall/Pearson 2004

the market

Potential readers include:

- students (beginning and advanced)
- teachers and professors
- professionals and interested laymen

The course notes were explicitly written for first year Computer Science and Information Science students. (The Information Science students are expected to choose the specialisation Multimedia and Culture, a curriculum provide by the Division mathematics and Computer Science of the Faculty of Science of the Free University of Amsterdam).

The course has a practical part and a theoretical part. which in combination takes 2-4 weeks, full time study.

How would the the potential category of users/buyers look at the book?
students:

+ compact, quick overview, few irrelevant details
+ exam can be learned by clicking on questions in checklist
- somewhat abstract, guidance or reference lookup is needed

instructors:

+ concise, well-structured overview, in presentation-ready form
+ provides full course, and skeleton practical assigment
+ skeleton exams, with backlinks for review
+ additional references to other material
- perhaps at some points too concise
- dependencies on online references

professionals:

+ quick overview + (online) references
+ material for making presentations
- rather concise (slightly academic) style

laymen:

+ easy to read overview
- reference to (too) many fields of knowledge

As the title indicates, the book is meant as an introduction to multimedia. More specifically, as an introduction to multimedia for first year Computer Science and Information Science students. When setting up the course, I discussed the topics and issues to be dealt with with collegues of the CWI, and we came up with a general description of the course. Then I selected the Principles of Multimedia Database Systems book (discussed in more detail below) and started the course. The course didn't work well. The topics seemed to be too limited, and although the book chosen is of high academic standards, it did not appeal to the students, due partly to the fact that is was too database-oriented. It also appeared that many students did not buy and read the book, but took the exam just by reading my course notes. They were assisted in this, I must admit, by the fact that I formulated a fixed set of questions, and provided backlinks from the questions to the course notes in the online version. For the time they had for it, I do consider that an adequate strategy. Since no other book seemed to meet my demands, I decided to take the existing course notes and extend them with material that I considered relevant and interesting. More in particular, also interesting for students. First year students are easily bored. The themes I organized the book around may be summarized as

- digital convergence
- broadband communication
- multimedia information retrieval

These themes allowed me to pay attention to a variety of subjects, popular trends in digital entertainment, but also standards in development such as MPEG-4, compression and multimedia information retrieval. In other words, I tried to find a balance between interesting material and academically relevant subjects.

Although the book could be extended with additional topics, it is my form conviction that the concise format of the book should be maintained.

outline

The manuscript is available at: www.cs.vu.nl/∼eliens/media

The material is being used in the course Introduction Multimedia, for the first time in 2002. for the second time in 2003.

The material is divided over 7 chapters. It includes a preface, afterthoughts and 5 appendices:

www.cs.vu.nl/∼eliens/media/pdf/doc.pdf Each section contains a *research di-*

rections subsection, which discusses ongoing research problems and gives suggestions for further reading.

As indicated in the *additional information* section, an additional chapter or appendix should be included to explain some of the popular technologies underlying multimedia (such as OpenGL and DirectX), and to give an overview of the various tools that can be used in digital content production (as for example Maya and Poser), and to discuss the contraints these technologies and tools impose on the workflow of an actual project.

sample chapters

The full online version can be found on: www.cs.vu.nl/∼eliens/media

The PDF version of the manuscript is available as:
www.cs.vu.nl/∼eliens/media/pdf/doc.pdf
A selection of sample chapters (of the revised manuscript, see below):

- preface (PDF)
- contents (PDF) (OCRed from the PDF of the manuscript)
- chapter 1 (PDF)
- chapter 3 (PDF)
- chapter 4 (PDF)
- chapter 8 (PDF)
- chapter 9 (PDF)
- chapter 10 (PDF)
- appendix *intelligent multimedia* (PDF)
- appendix *write an essay!* (PDF)

additional information

The manuscript has been prepared using latex which produces PDF. The software used, developed by the author, allows for producing HTML, latex and *slides* using one source text.

Over the last year I have been working at a DirectX based presentation system, which goes under the name ViP. Information about this can be found at www.virtualpoetry.tv[1]. It seems worthwhile to add material about DirectX, explaining DirectX technology, and the issues involved in developing a complex system with DirectX, involving various media such as (live) video, audio and 3D-graphics. In addition, an overview should be given of the variety of tools that can be employed in the development of digital content and the constraints these tools and technologies impose on the workflow of an actual project.

[1] www.virtualpoetry.tv

proposed enhancements

A number of possible enhancements (wrt. the current manuscript) have been mentioned. To summarize:

- tools and technologies – this can best be treated in an appendix giving (alphabetically listed) a brief characterization of the available tools and technologies with references to additional information
- game technology – an appendix that gives a brief introduction and 'how to start working' hints for DirectX and related technologies.
- multimedia technology – an additional chapter discussing the technological issues in multimedia projects. This chapter should present two or more case studies which illustrate the process of production, including the selection of appropriate tools and technologies and the workflow induced by a such a choice.

As a final comment, when the reviewers have recommendations concerning additional material or modification of some of the material, I am certainly willing to see how to accomodate their wishes provided that the approach of this book remains intact. On other issue is, whether the book must be augmented with visual material or illustrations. Again, the opinion of the reviewers will be taken into account in this respect.

revised outline (10/11/2004) updated: 4/4/2005

Since one of the reviewers objected against a possible imbalance due to the overweight of the appendices, the following structure is proposed:

preface

part I – digital convergence
1. what is multimedia?
2. information spaces

part II – delivery & presentation
3. codecs and standards
4. multimedia platforms

part II – multimedia information retrieval
5. information retrieval
6. content annotation
7. information system architecture

part IV – applications and technology
8. virtual environments
9. digital content creation
10. application development

afterthoughts
appendices
A. acronyms
B. Web3D

C. XML-based multimedia
D. a platform for intelligent multimedia
E. technologies and tools
F. write a paper!
references
index

Note that chapters 4, 9 and 10 are only provisional. The should cover the content sketched in the proposed enhancements. The material formerly in appendix E, the multimedia casus, should be part of chapter 9. The other chapters have been written, and may be enhanced following the suggestions of the reviewer(s).

answers to reviews – 5/2/2005 The reviews and my comments on these reviews are available online in

- www.cs.vu.nl/∼eliens/media/reviews.html

These include the latest reviews from 2005, as well as a reviews from 2004 and before. The review from 2004 suggested to extend the number of chapters to avoid overweight appendices. These suggestion resulted in the outline above, which has four parts: convergence, standards, content retrieval and applications. The 2004 review some comments were made also with respect to a number of technical issues as well as the writing style.

The 2005 reviews raise a number of issues, that I have answered to as may be read in the reference given above. The main issues and how it will affect the manuscript are listed below:

- structure – the structure (content table) will remain as given above in the revised outline, although some minor re-titling may occur.
- style – evidently the manuscript needs to be reworked to have a more flowing and in some parts easier to understand style. From the authors perspective, however, it is important to maintain a concise style. This implies that verbose definitional discussions of elusive issues as the definition of multimedia will not be given.
- illustrations – illustrations, and when appropriate, tabular overviews will be included, when re-working the manuscript. The number of illustrations will be limited though, about 5-10 per chapter. With regard to the production cost, the illustrations will, preferably, be black and white.
- learning framework – each chapter will start with a brief section *learning goals* indicating which topics will be dealt with, what are considered to be more specialist sections, and an indication of related material in the book.
- contents – as additional content (suggested by the reviewers)
  - usability – I will include a basic discussion of usability, in particular the apparent opposition between task-related and fun-related usability

measures. This will be done in the context of a more extensive case study that we did when developing a 'digital dossier' for the serbian-dutch artist Marina Abramovic.

– examples and applications – the aforementioned *digital dossier* application will be treated (in part IV), also in part I a number of applications will be discussed, in particular examples of media systems known to the students, such as Napster.

- specialist sections – the book should keep its specialised section, but an effort will be made to indicate this more clearly in the text, both by typographic means and by an indication in the *learning goals* sections.

- title(s) – a direct content-oriented way of chapter and section titling should be used.

  As for the title of the book itself, there is a choice between (in descending level of the author's preference):

  – introduction multimedia
  – introduction multimedia – convergence, standards, content retrieval and applications
  – a (not so) gentle introduction to multimedia
  – what is multimedia?
  – a concise treatment of multimedia from an academic perspective
  – principles of multimedia

  Nevertheless, I think that marketing considerations should dictate the choice of a title!

first revision of the manuscript (4/4/2005)

After the last round of reviews, I have revised the manuscript. The revision encompasses:

- the subdivision in parts, as indicated in the revised outline above
- writing chapters 4, 9 and 10
- appendix: resources, tools and technology
- inclusion of illustrations
- corrections wrt to style as indicated by the reviewers
- the inclusion of a selection of projects in the area of multimedia
- the learning framework
- an extra appendix: write a paper?

The learning framework no includes, *reading directivesa* and suggested *essay topics* with each part, and for each chapter *learning objectivesa*, *questions*, *projects and further reading* suggestions and an explanation/motivation of the choice of artwork.

A selection of projects in the area of multimedia has been included. Many of these projects are related to the artwork included in that chapter or elsewhere in the book. For each project, a brief description is given as well as references for further exploration.

The illustrations consist of a limited number of content-related diagrams, a selection of artwork from the area of games, animation, design and modern art that has a direct relation to the topics treated in the book, as well as a number of decorative illustrations. At the end of each chapter a reference is given to the sources from which the artwork is obtained, as well as a brief motivation explaining the relevance of the artwork in relation to the topics treated in the book. The illustrative material gives an interesting overview of genres and styles, and is as such very useful for students interested in visual design and digital content creation.

The newly written material includes an appendix on resources, tools and technology giving a reference to the most importaant information sources, the new chapters 4, 9 and 10, dealing with respicively DirectX, digital content creation, and application development. This material draws to a large extent on my own experience with these areas, and projects done with students at my University. This material, together with the illustrations, does sgnificantly broaden the scope of the book in comparison to the earlier version.

what needs to be done? Apart from further corrections of references, style, grammar and the flow of argumentation, the extension of the manuscript will be limited to the inclusion of some additional projects, and possibly the elaboration of some technical topics, such as for example JPEG compression.

second revision of the manuscript (25/4/2005)

Although the inclusion of artwork seemed to be a good idea, the immediate criticism was that the choice of the artwork, and the artwork itself was not sufficiently motivated, and might as such confuse the reader. Another criticism was that the (variety of) contents was not exposed in any way in the table of contents. And also the examples were considered too parochial, that is too much related to specifically dutch events or projects.

The second revision aims to remedy these criticisms, by:

- exposing the contents (to the subsection level) in the table of contents
- by a more careful selection of the artwork, and by making an explicit relation between the artwork and the text, in particular the examples. Also captions have been included indicating what the illustrations are about. (This modification has been executed for chapters 1, 4 and 10 only!)
- by including more (international) examples, to counterbalance the number of dutch examples and projects for which there is no good replacement.

The inclusion of examples seems to be a very good way, to motivate the additional artwork, as well as to give concrete examples that did not fit in well in the main text.

The revisions made justify a brief re-formulation of the rationale of this book:

> The book aims to give an academic overview of relevant topics in the application of multimedia and multimedia research. However, it also introduces the students to the area of digital content creation and multimedia application design, motivated by the authors own experience in these fields. The examples cover instances of innovating research as well as interesting projects in media art and visual design.

What needs to be done to complete the manuscript is the inclusion of more (international) examples, re-considering the artwork of the other chapters, and, when the manuscript is accepted for publication, there must be more scrutinous copy-editing. Also then, decisions about layout, formatting and printing must be made.

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