EUROHORCS

EURYI Application Form

European Young Investigator Awards

EURYI European Young Investigator Awards

Part A: Administrative details and Project Summary

Administrative details of applicant

Family Name	Nack		*Birth Family Name*		
First Name (s)	Frank-Michael				
Gender	Female	Male X	*Date of Birth*	*29/04/1962*	
1st Nationality	German		*2nd Nationality*		
Country of Residence	The Netherlands		*Country of Birth*	Germany	
Contact address					
Street Name and number	Kruislaan 413				
PO Box	94079	*Postal Code*	1090 GB	*Cedex*	
Town	Amsterdam		*Country*		
Phone 1	+31 20 592 4223	*Phone 2*		Fax	+31 20 592 4312
e-mail	Frank.Nack@cwi.nl				
Qualifications					
University degree	*Date of award (DD/MM/YYYY)*	31/09/1991			
Doctorate	*Date of award (DD/MM/YYYY)*	31/09/1996			
Full-time postdoctoral experience	*Number of months*	**80**			
Place of activity (previous 2 years)					
From	01/01/2001	*To*	31/12/2003	*Country*	The Netherlands
From		*To*		*Country*	
From		*To*		*Country*	

Administrative details of Host Institution

Name of Host Institution	Stichting Centrum voor Wiskunde en Informatica (CWI)				
Name of research unit/department	Information Systems				
Head of research unit/department	Prof. Dr. Martin Kersten				
Legal address					
Street Name and Number	Kruislaan 413				
Postal Code	1098 SJ	*Town*	Amsterdam	*Country*	The Netherlands
Phone 1	+31 20 592 9333	*Phone 2*	+31 20 592 4149	*Fax*	+31 20 592 4199
Web site	Html://www.cwi.nl				

EUROHORCS

EURYI Application Form

European Young Investigator Awards

EURYI European Young Investigator Awards

Part A: Administrative details and Project Summary

Project Summary

Project title (Maximum 100 characters)
Process-aware metadata for evolving media-based knowledge spaces
Project summary (Maximum 300 words)
The aim of this project is to provide the theoretical basis and basic technology for the new type of evolving media-based knowledge spaces, representing a 21st century "Library of Alexandria". These knowledge spaces facilitate complex domain information to be studied, discussed, commented on, published and demonstrated. They support the preservation and development of knowledge in an intelligent, communal way. This proposal proposes a research direction that understands metadata as active processes, inspired by knowledge representation methodologies from the humanities and communication processes described in evolutionary computing and biological semiotics. On the theoretical basis we seek to establish new metadata models where metadata is aware of its role within the given task within a particular application targeting particular domain knowledge. Allowing metadata to be aware of its use in various contexts facilitates a novel approach towards information retrieval, as information units can now actively participate in the response of user requests (the query specifies the requested information and its context and information can react on the request with an expectation value on their usability). Moreover, once selected, information units can facilitate support during all stages in the knowledge production circle, as their internal awareness allow new forms of human-machine interaction on the level of feedback, control, creativity, communication and adaptivity. Showing the applicability of the research we also seek to establish tools that support human creativity to provide the best material for the required task and additionally use the creative act to extract the significant syntactic, semantic and semiotic aspects of the content description. The target domain is that of interactive media art theory, history, and anthropology, where the emphasis is laid on the provision of tools and technologies for the semi-automated analysis, comparison and generation of interactive media productions.

Total Budget required

Year	*Salary (ies)*		*Travel & Subsistence*	*Material Costs*	*Minor equipment*	*Others*
	Awardholder	Other personnel				
1	65,492.16	82040.64	12,000			
2	67,173.12	120457.92	12,000			
3	68.756.16	125451.84	12,000			
4	70,420.80	125859.84	12,000			
5	72,509.76	89254.08	12,000			
Total	344,352.00	543064.32	60.000	24,000		

EUROHORCS

EURYI Application Form

European Young Investigator Awards

Applicant Declaration

In completing this application for a EURYI Award, I confirm that:

1.- If a EURYI award is offered, I will accept the terms and conditions applied by the sponsoring participating organisation.
2.- I confirm that to the best of my knowledge and belief, the information in this application is correct.

3.- I have not submitted an application to any other participating organisation under this call for proposals

***Signature of the applicant**…… …… **Date**……*

Host Institution Declaration

In submitting this application for a EURYI award, I confirm on behalf of the Administrative Authority of Stichting Centrum voor Wiskunde en Informatica that:
1.- We support this application for funding under the EURYI scheme.
2.- If a EURYI award is offered, we will accept the terms and conditions applied by the sponsoring participating organisation.

Administrative Authority

Name in Block Capitals Prof. Dr. J.K. Lenstra…… Position Director……..

Signature…….. Date……

Head of Department

Name in Block Capitals Prof. Dr. M. Kersten……..
Signature…….. Date……

EUROHORCS

EURYI Application Form

European Young Investigator Awards

EURYI European Young Investigator Awards

Name of Applicant: Frank-Michael Nack

Host Institution: Stichting Centrum voor Wiskunde en Informatica

Case for Support

Parts B, C, D, E and Appendixes

Note: ***Parts B, C, D and E*** should be completed in free style but you must address the numbered issues in each part (in number order). Furthermore you should do so in the context of the purpose of the scheme i.e. ***to enable outstanding young researchers from anywhere in the world, with potential to become world class leaders in their research area to work in a European environment for the benefit of the development of European science and the building up of the next generation of leading European researchers***. Therefore, in addressing the issue you should attempt to demonstrate that ***you*** meet these criteria in terms of your track record, the research you are now proposing and the suitability of the host institution to facilitate its implementation.

Part B: Background of the Applicant

B.1 Summary of results and conclusions of recent work in the scientific area covered by the research proposal

The key scientific challenge addressed by the Multimedia research community is to provide a sound theoretical foundation for the emerging knowledge spaces. The most prominent of all is the World-Wide-Web with which we are all intimately familiar. Everyone using it to search for information recognizes that we have not yet built the new library of Alexandria of the 21st century. The biggest hurdle to take is to find a solution to index it in a timely and meaningful way.

The quickly expanding space calls for automatically accessible metadata (information about the content of the media items). The need for such description schemata and related tools was a focal point of the keynote address at the 2001 ACM Multimedia Conference [4] and was further prominently discussed at panels and special sessions at the two major multimedia conferences, namely ACM Multimedia and the IEEE International Conference on Multimedia & Expo (ICME) [3, 9, 10].

The problem, however, with mainly machine-generated metadata is that is based on objective measurements of a media item, such as a colour histogram for images or frequency distribution for sounds, rather than on characteristics more amenable to human information processing and knowledge generation. For example, a user may be searching for a picture of a tomato, whereas all she can request is an approximately circular shape with a predominantly red colour. In other words, the low-level features that we are able to compute for media indexing and search do not match with the high-level meaning required in user queries [8]. The multimedia community now acknowledges that characterising audio-visual information using objective measurements is problematic. A paradigm shift is necessary to make significant progress.

The research proposal presented here explores one strand, based on the recognition that human interpretation of media is time- and context-bound. The ordering and (re-)classification of media items is a never ending task.

In contrast, current multimedia research typically regards the process of attributing metadata to a media item as a "batch process", where the metadata is computed and assigned to the media item and then the complete media repository is published for use. This single-pass process does not reflect the continuous process of interpreting and understanding the concepts expressed through the media item on a syntactic and semantic level. As a result, the large numbers of instantiated static schemata sooner or later add to the problem they once were established to solve – namely to handle the ever faster growing amount of media-based information.

A way out of this dilemma is to agree upon the collection of semantic-based and machine-processable metadata during established media workflow practices [1, 2, 5, 7]. The metadata generation process, rather than the original media item, needs to be considered as the basis of the process of knowledge accumulation. Changing the view on metadata in this fundamental way results in metadata gaining value by the inclusion of references to the context in and for which it is used. For example, metadata captured from a camera on pan and zoom information can be later used for the support of the editing process where the technical information is merged with the rhetoric of the presentation the material is used in. Dynamic metadata, documenting the progress of interpretation and understanding of a concept, leads to the requirement for the support of process-aware metadata. This, in turn, requires novel representation technology and we are only now able to initiate developments in this direction.

1. Marc Davis. “Active Capture: Integrating Human-Computer Interaction and Computer Vision/Audition to Automate Media Capture.” In: *Proceedings of IEEE International Conference on Multimedia and Expo (ICME 2003) in Baltimore, Maryland*, IEEE Computer Society Press, Vol. II, 185-188, 2003.
2. Doarai, C. & Venkatesh, S. “Bridging the Semantic Gap in Content Management Systems – Computational Media Aesthetics”. Media Computing Computational Media Aesthetics, Chitra Dorai and Svetha Venkatesh, Editors, pp. 1 – 9, Kluwer Academic Publishers, 2002.

3. Dorai, C., Mauthe, A., Nack, F., Rutledge, L., Sikora, T., and Zettl, H. *Media Semantics: Who Needs It and Why?* – Panel of the ACM MM conference. In Proceedings of the ACM Multimedia 2002, pp. 580 - 583, Juan-les-Pins, France, December 1-6, 2002.
4. Jain, R. *Teleexperience: Communicating compelling experiences.* In Proceedings of the ACM Multimedia 2001, page 1, Ottawa, Ontario, 2001.
5. Jain, R. *Experiential Computing.* Communications of the ACM **46**(7): 48-55. 2003.
6. Nack, F., v. Ossenbruggen, J. & Hardman, L. "That Obscure Object of Desire: Multimedia Metadata on the Web (Part I and Part II)." *To appear in IEEE Multimedia, 2004.*
7. Nack, F. "From Ontology-based Semiosis to Computational Intelligence - The Future of Media Computing." *Book chapter in Media Computing Computational Media Aesthetics, Chitra Dorai and Svetha Venkatesh, Editors, pp. 159 – 196, Kluwer Academic Publishers, June 2002.*
8. W.M. Smeulders et al. "Content-Based Image Retrieval: The End of the Early Years," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 22, no. 12, Dec. 2000, pp. 1349–1380.
9. ACM MM WS ETP03. http://ame.asu.edu/etp2003/home.html
10. ICME special; session. http://www.icme2003.com/SpecialSessions.asp

B.2 Information on current or past sources of research funding

Research funds:

05.1997 – 04.2000	Postdoctoral grant in the GMD Postdoctoral Program fully funding the postdoctoral research at the Integrated Publication and Information Systems Institute (GMD- IPSI), Darmstadt, in the domain of multimedia metadata.
02.2000 – 02.2002	DYNAMO project (Semi-automated Hypermedia Presentation Generation) Funded through the Nederlands Organisatie voor Wetenschappelijk Onderzoek (NWO), project number 612.061.009
03.2002 – 10.2002	Member of the European thematic network OntoWeb, standardisation special interest group.
11.2002 – 11.2004	CHIME project (Cultural Heritage in an Interactive Multimedia Environment) Funded through the Nederlands Organisatie voor Wetenschappelijk Onderzoek (NWO), project number 634.000.011

Postdoctoral positions:

Institute:	GMD Integrated Publication and Information Systems Institute (GMD- IPSI) now Fraunhofer Integrated Publication and Information Systems Institute (FHG – IPSI)
Address:	Dolivostrasse 15, 64293 Darmstadt, Germany
Head:	Prof. Dr.Erich Neuhold
Phone:	+49 (0) 61 51 / 8 69 - 8 02
Email:	neuhold@ipsi.fraunhofer.de
Period:	05.1997 – 04.2000

Institute:	Stichting Centrum voor Wiskunde en Informatica
Address:	Kruislaan 413, NL-1098 SJ Amsterdam, The Netherlands
Postal:	P.O. Box 94079, NL-1090 GB Amsterdam, The Netherlands
Head:	Prof. dr. Jan Karel. Lenstra
Phone:	+31 (0)20 592 4178
Email:	Jan.Karel.Lenstra@cwi.nl
Period:	02.2000 – present

B.3 Experience of team leadership and project management

09.2003 – present	Associate editor in chief for IEEE Multimedia

07.2000 – present	Editor for IEEE Multimedia Responsible for the “Media Impact” Column
11.2002 -- present	Project coordinator for CHIME (8 people)
03.2000 – 02.2002	Project coordinator for DYNAMO (3 people)
05. 1997– 03.2000	Head of the MPEG-7 research unit at GMD-IPSI (4 people) handling the A4SM, a framework for distributed digital video production YO, an extended hypermedia environment for the exploration of large media-based knowledge spaces (3 people) TINKY, an emotion editor for web-based VRML-faces (2 people).
04.1999 – 10.1999	Co-Chair of the ISO MPEG-7 Description Definition Language Development Group
02.1998 – 03.1999	Chair of the ISO MPEG-7 Description Definition Language Development Group

B.4 A list of the most relevant publications

All journals and conferences are peer-reviewed

1. “Saying What It means: Semi-automated (News) Media Annotation”, Co-authored with Putz, W. To appear in International Journal Multimedia Tools & Applications, Kluwer Academic Publisher (2004).

   We consider the automated and semi-automated annotation of audiovisual media in a new type of production framework, A4SM (Authoring System for Syntactic, Semantic and Semiotic Modelling).
2. “That Obscure Object of Desire: Multimedia Metadata on the Web (Part I and Part II) ”, Co-authored with van Ossenbruggen, J. & Hardman, L. To appear in IEEE MultiMedia Journal (2004)

   We discuss the state of the art in metadata for audio-visual media in large semantic networks, such as the Semantic Web. The discussion is predominantly motivated by the two most widely known approaches towards machine-processable and semantic-based content description, namely the Semantic Web activity of the W3C and ISO’s Multimedia Content Description Interface (MPEG-7).
3. “Colour picking - the pecking order of form and function.”, Co-authored with Manniesing, A. & Hardman, L, In proceedings of the International ACM MultiMedia conference 2003.

   We investigate the ability of multimedia presentation generation to balance the functional aspects of a presentation that address the information needs of the user, and its aesthetic form. We demonstrate our approach using automatic colour design for which we integrate relevant aspects of colour theory.
4. “From Ontology-based Semiosis to Computational Intelligence – The Future of Media Computing”, Book chapter in “Advances In Media Computing: Computational Media Aesthetics” edited by Chitra Dorai and Svetha Venkatesh, Kluwer Academic Publishers 2002.

   I investigate the underlying structural requirements for media-aware knowledge spaces and discus the merging of media generation and annotation to facilitate the use of media-based information for diverse purposes.
5. “Denotative and Connotative Semantics in Hypermedia: Proposal for a Semiotic-Aware Architecture.” Co-authored with Hardman, L., in The International Journal The New Review of Hypermedia and Multimedia, Taylor and Francis, 2001

   In this article we claim that the linguistic-centred view within hypermedia systems needs refinement through a semiotic-based approach before real interoperation between media can be achieved and propose an architecture for a dynamic semiotic-aware hypermedia system.
6. “Designing Annotation Before It's Needed.” co-authored with Putz, W., in the Proceedings of the ACM Multimedia conference (2001),

   This conference paper describes the automated and semi-automated annotation of audiovisual media in a production framework that provides tools and technologies for the authorship of linear and interactive media productions, based on the example domain of news.
7. “Everything you wanted to know about MPEG-7: Part I & II.”, co-authored with Lindsay, A., in IEEE Multimedia Journal (1999),

We provide a detailed overview of the goals and achievements of MPEG-7.

8. "The Application of Video Semantics and Theme Representation in Automated Video Editing", co-authored with Parkes, A., in International Journal Multimedia Tools & Applications, Kluwer Academic Publisher (1997),

   We consider the automated generation of humorous video sequences from arbitrary video material by presenting AUTEUR, an experimental system that embodies mechanisms to interpret, manipulate and generate video.

B.5 A statement of timeliness

During the last few years I have been advocating that media data needs to be annotated on various semantic levels if we wish to make it accessible to users at the right time in the right form to suit their needs (see section B2, references 4 and 5). The transformation of these ideas into referenced technology and the discussion for more semantic-based research through colleagues stimulated by me in IEEE Multimedia (see references 2 – 5 in B1) helped shift the direction of Multimedia research away from low-level feature and systems research towards higher-level semantics, as recently acknowledged in the new alignment of the ACM Multimedia Conference. In addition, I have been one of the founding members of the COSIGN series of conferences [http://www.cosignconference.org/], which is understood as a network of excellence for the development and use of higher-level semantics in new media with increasing participation from both new media artists and computer science researchers.
The next step in the development of dynamic metadata is, however, to provide real world cases that show the applicability of semantic-aware technology within realistic work practices. The development of this set of reference technology requires that I have a small and dedicated team that not only designs and develops the basis for such technology with me but is also determined to present and distribute the vision of media-based evolving knowledge spaces. (see section C 4 for further details). While this group retains its own identity, it requires at this stage a working infrastructure as provided by INS-2, INS and CWI – for technical, intellectual and promotional reasons (see part H for details).

B.6 Research Collaboration (both national and international)

National:

- Technische Universiteit Eindhoven (TU/e), Computing Science – Databases and Hypermedia

Work together with Prof. Paul de Bra's group within the CHIME project on fundamental problems of user adapted knowledge representation.

- Vrije Universiteit Amsterdam (VU), Faculty of Sciences, Department of Computer Science

Explore with Prof. Guus Schreiber's group within the CHIME project the further development of media-based ontologies with respect to dynamic knowledge space environments.

- Technical University Delft (TU Delft), Information Systems and Technology - Information Systems

Supervised masters thesis work.

- Nederlands Instituut voor Mediakunst, Montevideo/Time Based Arts, Amsterdam and Institute for Unstable Media (V2_), Rotterdam

In both institutes I work together with researchers (Annet Dekker and Anne Nigten) on the representation of their media assets to the greater public.

International:

- Curtin University, School of Computing, Multimedia Group, Perth, Australia

Collaborate with Prof. Svetha Vankatesh on a special issue for Springer/ACM Multimedia Systems (Media Grammar) and worked with her and Chitra Dorai (IBM Watson) on the IEEE Multimedia - Media Aesthetics issue. Served as examiner for two of her PhD students.

- DSTC, Multimedia Meta-data Models and Ontology Group, Brisbane, Australia

Work together with Jane Hunter, based on our collaboration on the DDL board, on problems of media annotation. We have established a PhD student exchange between her group and our own.

- Open University, Knowledge Media Institute, Milton Keynes, UK

Together with Simon Buckingham Shum I am establishing a new hypermedia presentation paradigm, focusing on the exploitation of rhetoric structures within various media for the presentation of complex knowledge structures. Served as examiner of his PhD student Clara Mancini (who is a perfect candidate for the first postdoc position described later in this proposal).

- University of California at Berkeley, Garage Cinema Research Group, Berkeley, USA

Prof. Marc Davis and I have collaborated over the last 8 years on various projects covering the modelling and instantiation of media-based technology. This year we established an exchange of PhD students between his group and our own. We also organised the best-attended full day tutorial at ACM MM 03. For the year 2004 a 4 month visit of myself at his group at Berkeley is scheduled, where we are going to work on the integration of the various multimedia standards into a manageable open software platform. I am also giving classes on the topic of meta-data for media production to students from various departments at Berkeley.

- Arizona State University, Dep. of Computer Science and Institute for Studies in the Arts, Tempe, USA

Together with Prof. Hari Sundaram I established a new and successful ACM MM workshop on Experiential Systems. In addition we are currently working on a project for new immersive presentation strategies in museum environments.

B.7 Information on prizes or special awards given in recognition of your scientific achievement (not applicable)

B.8 Other (not applicable)

Part C: Project Description

C.1 Overall aims and objectives of the research

The vision of this project is to provide a quantum leap towards the "new library of Alexandria of the 21st century". The aim is to develop a sound theoretical foundation for *evolving media-based knowledge spaces*. This allows the development of information-processing environments where complex domain information can be studied, discussed, commented on, published and presented. These media-based knowledge spaces will become an integral part of future personal computing environments, although they will tend to work in the background, becoming less prominent than the direct manipulation based interfaces to which we are accustomed today.

The aim of this project is, thus, to establish tools that first support human creativity to create the best material for the required task and additionally use the creative act to extract the significant syntactic, semantic and semiotic aspects of the content description. We are aiming for the development of a media-aware semantic environment that can handle (e.g., locate, transfer, integrate) multimedia-based segments and fragments of information. In such a way it supports simultaneous comparison of theoretical train of thought by providing complete up-to-date media data. The initial target domain for these tools and technologies is that of interactive media theory, history and anthropology. The emphasis is laid on the provision of tools and technologies for the semi-automated analysis and comparison of interactive media productions. This domain is highly appropriate for this work because a great variety of media is constantly generated, manipulated, analysed, and commented on. It is also a typical example of cross-organizational, multidisciplinary, and cross-site teamwork. This typically exemplifies the description of audio-visual material as an ongoing task specific process.

Communities are only interested in process-aware media-based knowledge spaces, however, if they are robust. In our opinion the main task is, therefore, to provide real world cases that show the applicability of semantic-aware technology.

To reach our goal we propose to deploy *semantic-based, machine processable meta-data* for information objects. The *metadata must be able to include subjective criteria and be aware of the context in, and for, which it is used*. The metadata is not authored by "after the fact" manual or automatic processes, but accumulated during the existing media-processing chain. This proposal builds on the conclusions drawn by the multimedia community (see section B1) and goes further by suggesting a research direction that employs metadata in the context of active processes.

In this project we investigate the extension of existing metadata standards, such as Dublin Core, the AAT, the semantic web activity of the W^3C and ISO's MPEG-7 and MPEG-21. Moreover, we explore metadata models beyond the traditional linear approach by representing tasks (such as generating, restructuring, representing, resequencing, repurposing and redistributing information), and relating them to process concepts such as task rhetoric, temporality of information and knowledge, interactivity, point of view, etc.

Such work forms the basis for solutions to model the relationships between context and task processes. Moreover, we are then in the position to understand the relevance of domain and task ontologies for the representation of events. Similarly, we are also able to solve presentational issues, such as the adaptation of dynamic metadata structures to the visualization of work processes, or the relation between event rhetoric and presentation style.

C.2 Proposed methodology to be used

The research methods used reflect the interdisciplinary approach. The overall methodology exercised in this research is to identify applicable processes in existing methodologies for information generation and knowledge processing, mainly form the humanities and cognitive science. The identified processes are integrated in existing meta-data technology. Where this is not possible we improve this technology with them by using process approaches from various fields in computing science. We evaluate the gained results on an empirical basis (user tests) and reapply the described development process until satisfactory results for the domain in particular and the research field in general are obtained.
The aim is to combine the theoretical models developed in such areas of humanistic inquiry as

- Epistemology (theory of knowledge especially with reference to its limits and validity)
- Phenomenology (the typological classification of a class of phenomena)
- Semiotics (theory of signs and symbols comprising syntax, semantics, and pragmatics of media-based artefacts)
- Hermeneutics (the study of the methodological principles of interpretation)
- Rhetoric (the study of writing or speaking as a means of communication or persuasion)
- Interactive media theory, history, and anthropology (dealing with the raw material and its use of time, space, colour, sound, props, etc.; the methods and techniques processes which shape and treat the raw material, as well as the underlying psychology or economics; and the forms and shapes including views on categories, the adaptation of other art forms, genre and audience expectations)

with the concepts, technologies, and methodologies from computer science, such as

- Evolutionary computing
    - Adaptation of developmental processes such as pattern formation, morphogenesis, cell signalling as described in biology for the field of knowledge representation and knowledge generation
- HCI
    - cognitive based modelling of processes (ACT-R))
    - interfaces for tasks and needs (Delta Methods),
    - hypermedia coherence theory for the presentation of media-based rhetoric argument guidance (Rhetorical structure theory (RST) and Coherence relations)
- Artificial Intelligence
    - modelling argumentative discourse in general and scholarly argumentation (ScholOnto Methodology) and narrative, categorical, and hybrid sequencing strategies for model-based presentation generation
    - semantic networks
    - ontology design ,
    - knowledge representation for task, domain and inference knowledge based on the “CommonKADS,” methodology,
    - spatio-temporal reasoning and inference logic.

The usability of the prototypes is evaluated empirically, based on user test with respect to usefulness of representation structures for real world tasks. Additionally, we also evaluate the usefulness for the visualisation of structures and processes in the user interface. The gained results subsequently improve the design of representation structures, processes and graphical user interface.
The development of a prototypical environment as proof of concept requires, however, that we get a better understanding of the domain. We seek the help from practitioners from the domain and rely here on our collaboration partners at the Nederlands Instituut voor Mediakunst, Montevideo/Time Based Arts in Amsterdam and the Institute for Unstable Media (V2_) in Rotterdam (see also section B 6).

C.3 Timeliness and novelty of the proposed research

The research outlined in this proposal emerged out of the substantial work provided on the description of multimedia content. The existence of initiatives such as ISO MPEG-7 and W3C's Semantic Web illustrate that semantic annotation play an essential role in future information systems. These two different approaches, however, demonstrate essential differences in both philosophy and implementation. Based on insights provided by this large amount of accumulated experience we are now able to investigate in detail answers to the questions we pose about metadata for non-textual media (see for example initial work in this direction (Section B4, reference 2).

The steady technological progress in the multmedia research area with respect to hardware (e.g. digital cameras) and software (e.g. Photoshop) changed our social way of communicating information so dramatically that the amount of generated multimedia information units is not longer manageable. The proposed solution, namely providing metadata that allows a machine to access and manage this type of information shows first signs of similar exhaustion, as the complexity of description schemata is growing and with it the amount of generated data. Moreover, as the aim is a mere automatic annotation and interpretation it seems that the generated metadata is not applicable to human information needs.

As technology for the exploration and exploitation of media-based metadata is still in its infancy it is now the right time to explore different paths. Allowing metadata to be aware of its use in various contexts facilitates a novel approach towards information retrieval, as information units can now actively participate in the response of user requests (the query specifies the requested information and its context and information can react on the request with an expectation value on their usability). Moreover, once selected, information units can facilitate support during all stages in the knowledge production circle, as their internal awareness allow new forms of human-machine interaction.

C.4 Management of the project

The aim of the local management level is

- to manage and control the project's resources, schedules and activities,
- to check the consistency between the project development and the strategic objectives of participants (the research results should foster swift developments in the research domain but at the end both PhD students should receive their doctorates and the postdocs should have established themselves in the domain and be on the verge of establishing their own groups)
- to ensure the overall quality of all systems and results.

The two Ph.d and Postdoc positions are advertised on an international level, making use of the available information networks of the relevant communeties. As the positions will be publicised internationally, the procedure will start early enough to accommodate time for interviews (not more than 3 for each position) as well as for potential visa applications.

The responsibility for finances with respect to controling the available resources is taken by the financial department of CWI. The allocation of funds within the project is organised by the senior researcher.

Though both PhD students and postocs are encouraged to plan their own research schedules, which is understood as a part of their skill improvement schema, a fixed group meeting per week is organised to allow for quick synchronisation between the group members or strategic discussions if required. Two larger events (around two days) per year are scheduled for in depth discussions between the members of the group and associated institutes.

More important is, however, that all participants within the projects are presenting and distributing the common vision of the group. For that it is envisioned to

- establish and lead a network of excelency that combines the relevant research institutions in Europe required for the interdisciplinary approach outlined in this proposal. This network not only allows to streamline the development of the new

generation of metadata and process aware knowledge spaces but also allows a wider distribution of the research ideas and results in different contries. Potential candidates are those groups on a European level I am already collaborating with as well as those that are mentioned in part C5 and C6 in this proposal. Moreover, all those groups that already contribute to the COSIGN series ofconferences.

- support frequent visits of the PhD students as well as postdocs in related research groups, menaning inside the network of excelensy but also on a world level (see among others those institutions I already collaborate with). This not only fosters their intelelectual view on their reseach in form of research and group organisation but also makes them and the ideas they are following visible – an essential criteria for becoming a member of the next generation of leading researchers in the field.
- encourage and assist the students and postdocs in setting up workshops, tutorials and special sessions at the relevant conferences which again increases their visibility and naturally the one of the research direction – the same applys to myself.
- based on the experiences gathered as editor at IEEE MM it seems natural to found a new type of interactive journal, either under the wings of IEEE or ACM – SIGMM, that not only promotes the newest research results within the outlined research domain but also allows the discussion of further research developments. The aim is is to establish a forum between the yearly conferences to speed up the distribution of ideas. The journal is planned to be interactive and to use the technology developped in the research (eat your own dog food!) – and it is edited by my group, preferably with a link to the groups web page. This pageis aimed at to become the center of research on process-aware metadata and complex media-based knowledge spaces.
- further develop already established workshops up to the level that at some stage a conference for the research direction can be established. Within this conference other already established venues can be absorbed, such as the COSIGN conference.

C.5 International context of the research in this field

As the suggested research is setting up a new, pioneering field there is not direct context it can be set in. The closest groups, however, working in similar directions are

- The Technische Universiteit Eindhoven (TU/e), Computing Science – Databases and Hypermedia, though this group is not so much interested in the representation and instantiation of process-aware metadata for complex media-based knowledge spaces but rather in the user modelling aspects to adapt the information to the user needs.
- Vrije Universiteit Amsterdam (VU), Faculty of Sciences, Department of Computer Science – one of the leading groups with respect to research on the semantic web and ontologies in combination with problem-solving methods. Part of their work is relevant, in particular the ontologies for annotating images, but their view on metadata is static.
- Open University, Knowledge Media Institute, Milton Keynes, UK. This group is interesting, as they try to understand knowledge spaces in the context of discourse structures, mainly of scholarly discourse. The dynamic aspects of this research path are relevant for the representation of process-aware complex knowledge spaces with respect to the representation of relations. Yet, the group is mainly interested in text documents and thus follows largely the semantic web approach advocated by the W^3C (http://www.w3.org/2001/sw/), which is text document based.
- DSTC, Multimedia Metadata Models and Ontology Group, Brisbane, Australia which is one of the closest groups in the world with respect to the instantiation and use of media-based metadata. They approach question with respect to Multimedia Metadata Models/Ontologies, Standards and Schemas; Indexing, Search, Browse, Retrieval and Filtering tools for Multimedia; Multimedia Interoperability, Digital Libraries, Collections Management for Cultural Institutions. Yet, their approach also considers metadata as static but they show first signs of moving into the direction of process awareness.

- University of California at Berkeley, Garage Cinema Research Group, Berkeley, USA which is the other group in the multimedia world that is closer to the research direction advocated in this proposal. This group is researching media metadata, automated media capture and automated video editing. The approach taken is implicitly aiming for process awareness, though the provided structures are still following the established static representation paradigm.
- Arizona State University, Dep. of Computer Science and Institute for Studies in the Arts, Tempe, USA and Georgia Institute of Technology, Experiential Systems Research Group, USA. The research of both groups is interesting as they investigate the use of experience in the management of enormous volumes of disparate heterogeneous data. In particular the representation of event structures is their focus of research. Though this is relevant for the research described in this proposal it only covers an aspect of the required representations and algorithms of our research direction.

With all of these groups we already have established collaborations and during discussions at panels and special sessions at the two major multimedia conferences, namely ACM Multimedia and the IEEE International Conference on Multimedia & Expo (ICME) it was decided, that our direction would enhance the various approaches described above through further development and integration.

C.6 Expected results in relation to the current international status of research in this field

The results of this new research direction stimulate and reshape work on

- Generation, maintenance and exploitation of complex knowledge spaces as we are then able to make explicit the assumptions implicit in the interpretations people make of data. We are able to communicate interpretive context and background.
- The development of ontology technology as then the representation of processes and context can be represented
- The domain of knowledge presentation in general as solutions to the representation of the form, structure, function, and effects of data finally allows to address *aesthetic* dimensions of data.
- The domain of information retrieval where process-aware metadata changes the traditional order and selection-based retrieval approach into a negotiation-based approach with more precise user-centred information provision.
- The automation of digital media production and reuse
- The automatic visualization of dynamic information in interactive environments

Thus, the work of this proposal works as a catalyst for various research directions within the domain of multimedia computing.

C.7 Statement of scientific impact and potential for promoting innovation

As outlined in section C.6, the research influences various sub-fields of multimedia computing as well as computer science in general. In section C4 and C5 we already described how the results of the research are promoted within the research community. Yet, due to my contacts with industrial partners, such as IBM (Chitra Doari - Watson research centre and Werner Kriechbaum - Böblingen research centre), Motorola (Kevin Brooks – User Interface Lab) and Philips (Nevenka Dimitrova – Philips Research Multimedia), all research groups that think in a similar direction, it seems plausible that the work can be integrated into an industrial environment. What is not investigated yet, but is also part of the project, is to negotiate with a larger content provider, such as Sony/BMG or Microsoft, how the gained results can be incorporated into their infrastructure. Patent questions will be resolved as required.

C.8 Work Plan

Workplan																				
Category	**Year 1**				**Year 2**				**Year 3**				**Year 4**				**Year 5**			
Senior researcher				**R1**				**R2**				**R3**				**R4**				**R5**
Postdoc 1				**M1**				**M2**				**M3**								
Postdoc 2																**M4**				**M5**
PhD 1		**P1**						**P3**								**P5**				
PhD 2						**P2**						**P4**								**P6**

Milestones

They represent the results per year produced by the whole group

M1: First design of the context model (including the paradigmatic and syntagmatic levels of context relations), event model (point of view, temporality, interactivity) and task rhetoric based on a domain and process analysis performed in the first half year in cooperation with Nederlands Instituut voor Mediakunst, Montevideo/Time Based Arts, Amsterdam and Institute for Unstable Media (V2_), Rotterdam.

M2: First implementation of the underlying data management system with a bare user interface using the refined models for context and event. Refinements are based on user evaluations of the established models. The event model now includes also first mechanisms to describe the level of dominance. Incorporation with relevant domain ontologies is achieved.

M3: First functional prototype with a workable interface. This prototype is used in both associated institutes by media researchers and artists to produce a process-aware knowledge space. This prototype is tested in year 4 to provide a better understanding about the GUI component.

M4: Improved prototype. The improvements are based on the development of new visualization techniques that relate to the active character of the metadata. This prototype also contains the first mechanisms on context similarity.

Status reports (reflecting the ongoing research progress)

The senior researcher and post docs provide these reports.

R1 – R4: Project Management Reports – technical and financial.

R5: Final Project Report, summarizing the major results, including a comprehensive evaluation and discussion of the project results.

Reports of PhD students (reflecting their development)

P1 and P2: Literature survey and state-of the-art analysis, specification of final application scenario, including the application description by the PhD student.

P3: Progress report, including descriptions of developed models for task (including temporality and interactivity) and event, as well as task rhetoric, and their implementations by PhD student 1.

P4: Progress report, including descriptions of developed models with respect to presentation style, task and event rhetoric and the implementations by PhD student 2

P5: Thesis by PhD student 1.

P6: Thesis by PhD student 2.

Part D: Financial Plan and justification of resources awarded

Table 1 below includes a detailed budget for the 5-year period according to the standards procedures of Stichting Centrum voor Wiskunde en Informatica (CWI). The salaries are bruto salaries. The costs for equipment reflect CWI's policy to update hardware and software every two years (the assumed hardware includes laptops for all project members as well as a project dedicated streaming server).

Cost summary in Euro								
Category	Year 1	Year 2	Year 3	Year 4	Year 5	Travel	Equipment	TOTAL
Senior researcher	65,492.16	67,173.12	68,756.16	70,420.80	72,509.76	16,000.00	6,000.00	366,352.00
Postdoc 1	47,066.88	48,862.08	50,428.80			12,000.00	4,000.00	162,357.76
Postdoc 2				47,066.88	48,862.08	8,000.00	2,000.00	105,928.96
PhD 1	34,973.76	36,622.08	38,400.96	40,392.00		12,000.00	6,000.00	168,388.80
PhD 2		34,973.76	36,622.08	38,400.96	40,392.00	12,000.00	6,000.00	168,388.80
TOTAL	147,532.80	187,631.04	194,208.00	196,280.64	161,763.84	60,000.00	24,000.00	**971,416.32**

Part E: Host Institution

The host institution chosen for the outlined project is the Stichting Centrum voor Wiskunde en Informatica (CWI) in Amsterdam.

CWI is a private, non-profit research institute that aims at fostering frontier research in mathematics and computer science, and to transfer new knowledge in these fields to society in general and trade and industry in particular. CWI's mission is realized by several means. In addition to the standard ways of disseminating scientific knowledge, for example through publications, presentations at conferences, organization of workshops and exchange of researchers, CWI actively pursues joint projects with external partners, provides consulting services and actively stimulates the creation of spin-off companies. A technology transfer event is organized annually to promote this side of CWI's activities. Also special efforts are made to make research results known to non-specialist circles, ranging from researchers in other disciplines to the public at large. CWI has many contacts with national organizations for applied research with wide experience in turning research results directly into practical applications. State-of-the-art computing facilities and a library of national importance support its researchers. CWI has extensive experience in managing international collaborative research efforts. CWI is also strongly embedded in Dutch university research: about twenty of its senior researchers hold part-time positions as university professors and several projects are carried out in cooperation with university research groups. Annually CWI hosts some 200 visiting scientists from abroad. CWI has a staff of 210 full time equivalent, 160 of whom are scientific staff. As CWI supports frontier research the technical infrastructure is kept up to date with the most recent technological developments.

The cluster **Information Systems (INS)** pursues research in areas that bridge the gap between theoretical and experimental computer science. The cluster has a longstanding international reputation in the design of algorithms for distributed systems and parallel database technology. More recently, machine learning, multi-media systems, and data mining have become a focal point of activity and increased international attention.

The **Multimedia and Human-Computer Interaction group** (INS2) has been involved with the development of models and authoring systems for multimedia and hypermedia since the early 1990's. Results of this work include the Amsterdam Hypermedia Model, contributions to the W3C SMIL 1.0, SMIL 2.0, and XHTML recommendations, the hypermedia authoring system GRiNS, and the CWI spin-off company Oratrix. Members of the group, namely Lynda Hardman, Jacco van Ossenbruggen and Lloyd Rutledge, have been active in W3C's HTML and SYMM Working Groups and ISO's MPEG7 DDL Working Group (Frank Nack).

Over the last three years I have been a member of the INS-2 group. The involvement of the group in research on models and tools for automatic generation of high-quality hypermedia presentations, as well as the groups participation in the development of the semantic web allowed me to investigate new areas of intelligent media-based metadata technology. The high intellectual calibre and international recognition of the group as well as its connectivity with the relevant research groups in hypermedia, semantic web and multimedia research world-wide is one of the reasons why I chose CWI as the host institution. As I have not gained a professorship in the Netherlands yet, though the grant would help to achieve this goal, it is of great help that Lynda Hardman holds a professorship at the University of Eindhoven, which enables me for the time being to provide a place for both Ph.D. students where they can obtain their degree in the time of the project.

Another reason is the open-minded environment of the cluster and the institute in general which allows the necessary interdisciplinary cooperation required for the outlined project.

Finally, CWI presented itself to me over the last three years as an organisation open for and fostering new ideas by showing trust into the in capabilities of the individual – thus providing an intellectual and social environment essential for the project outlined in part C of this proposal.

Appendix 1: CV of applicant

Name	Dr. Nack, Frank-Michael
Address	Zacharias Jansestraat 32 II NL-1097 CM Amsterdam
Telephone	+31 20 4639916 (home) +31 20 5924223
Electronic mail	Frank.Nack@cwi.nl
URL	http://www.cwi.nl/~nack/
Date of birth	29.04.1962
Place of birth	Berlin, Germany
Nationality	German

University

11.1993 - 09.1996 Study of Applied Artificial Intelligence in the domain of Automated Film Editing at Lancaster University (UK).
Supported by a grant from Lancaster University.
Degree: Ph.D.
Subject of thesis:

AUTEUR: The Application of Video Semantics and Theme Representation in Automated Film Editing (Prolog)
Supervisor: Dr. Alan Parkes
Examiner: Dr. Paul Brna (Lancaster University, UK)
Dr. Philippe Aigrain (IRIT, France)

10.1990 - 09.1991 Study of Applied Artificial Intelligence at the University of Aberdeen, Scotland (UK).
Supported by grants from the German Academic Exchange Service (DAAD) and the Science and Engineering Research Council (SERC)
Degree: MSc in Applied Artificial Intelligence
Subject of dissertation:

Development of a system for transforming hypertext-documents into paper-documents (Prolog)
Supervisor: Pat Fothergill.

10.1985 - 02.1989 Study of Computing Science at the Fachhochschule (FH) Darmstadt (Germany).
Degree: Diplom Informatiker (FH)
Subject of dissertation:
Development of an information-system for distance software maintenance (C)
Supervisor: Dr. Norbert Krier

10.1982 - 04.1985 Study of Law at the University of Heidelberg (Germany)

Employment

03.2000 – present	Centrum voor Wiskunde en Informatica (CWI), Amsterdam Member of Multimedia and Human Interaction Group Position: Postdoctoral Researcher Concentrating on research on content description of audio-visual media to allow the automatic generation of hypermedia presentations. Responsible for the projects: Dynamo (Semi-automatic Hypermedia Presentation Generation), CHIME (Cultural Heritage in an Interactive Multimedia Environment – funded through the NOW project ToKeN2000 (Toegankelijkheid en Kennisontsluiting) and OntoWeb (Ontology-based information exchange for knowledge management and electronic commerce). Worked on the MPEG-7 standard (co-author of the DDL Development Document). Contributed to the writing of a number of EU proposals. Examiner in PhD defences (Curtin University, Australia and Open University, UK). Supervised BSc students at the FH Darmstadt, Germany and MSc as well as Ph.D. students at CWI.
09.2003 – present	Associate editor in chief for IEEE Multimedia
07.2000 – present	Editor for IEEE Multimedia Responsible for the “Media Impact” Column
05.1997 – 03.2000	Integrated Publication and Information Systems Institute (GMD- IPSI), Darmstadt Member of the Mobile and Interactive Media Group. Position : Postdoctoral Researcher Conducted research on the formal description of media content (including work on the MPEG-7 Standardisation Committee – Editor of the Requirements Document and the Context & Objectives Document and Chair of the DDL Development Group). Also performed research on the semi-automated generation of media related metadata during the production process. Responsible for the following projects: A4SM, a framework for distributed digital video production YO, an extended hypermedia environment for the exploration of Eisenstein's Work TINKY, an emotion editor for web-based VRML-faces. Contributed to the writing of a number of EU proposals.
09.1998 – 02.2000	Fachhochschule Darmstadt, Computing Science Department, Darmstadt Position: Lecturer (Multimedia System Design) Teaching the mandatory course: Multimedia Techniques I & II
03.1998 - 07.1998	Fachhochschule Darmstadt, Computing Science Department, Darmstadt Position: Lecturer Teaching the optional course: AI and Entertainment
02.1997 - 04.1997	Gothenburg University, Department of Informatics, Gothenburg Position: Research associate Development of a framework for agent technology in CSCW oriented media-networked environments
10.1996 - 12.1996	Lancaster University, Cooperative Systems Engineering Group (CSEG), Lancaster Position: Research associate

	Investigation towards the Application of Narrative Techniques in Virtual Reality and Business Processes Applications
02.1994 - 07.1995	Contract work for Dr. Alan Parkes within the EU COMETT programme, Lancaster Field : Educational software Design, programming and maintenance of educational software in the domain of electronics. Created also the German version.
11.1993 - 12.1993	WDR, Cologne Field: Film editing Practical in film editing Knowledge elicitation exercise that involved studying and interviewing editors at work in their own environment
07.1993 - 11.1993	DANET, Darmstadt Field : Conference systems Design, programming and maintenance of a graphical user interface (C, Windows)
10.1991 - 03.1993	KOMunity Software AB, Stockholm Field : Conference systems Design and programming of a graphical user interface (C, Visual Basic) Supported by the EU COMETT programme
07.1989 - 06.1990	Siemens AG, Munich Field : data communication / networks System programmer for transport layer (C)
07.1987 - 06.1988	Nixdorf Computer AG, Frankfurt Field : Banking software programming a printer for statements of accounts (Cobol)
01.1982 - 03.1989	Private Vocational School Bahr, Darmstadt Type of work: Administration, secretarial, teaching (Pascal, Fortran)

Key Publications

1. Multimedia Tools & Applications 2004, “Saying What It means: Semi-automated (News) Media Annotation”. Co-authored with Putz, W. To appear.
   We consider the automated and semi-automated annotation of audiovisual media in a new type of production framework, A4SM (Authoring System for Syntactic, Semantic and Semiotic Modelling).
2. IEEE MultiMedia 2004, “That Obscure Object of Desire: Multimedia Metadata on the Web (Part I and Part II) ”. Co-authored with van Ossenbruggen, J. & Hardman, L.. To appear.
   We discuss the state of the art in metadata for audio-visual media in large semantic networks, such as the Semantic Web. The discussion is predominantly motivated by the two most widely known approaches towards machine-processable and semantic-based content description, namely the Semantic Web activity of the W3C and ISO’s Multimedia Content Description Interface (MPEG-7).
3. ACM Multimedia 2003, “Colour picking - the pecking order of form and function.” Co-authored with Manniesing, A, & Hardman, L
   We investigate the ability of multimedia presentation generation to balance the functional aspects of a presentation that address the information needs of the user, and its aesthetic form. We demonstrate our approach using automatic colour design for which we integrate relevant aspects of colour theory.

4. Kluwer Academic Publishers 2002, “From Ontology-based Semiosis to Computational Intelligence – The Future of Media Computing”. In “Advances In Media Computing: Computational Media Aesthetics” edited by Chitra Dorai and Svetha Venkatesh

   I investigate the underlying structural requirements for media-aware knowledge spaces and discus the merging of media generation and annotation to facilitate the use of media-based information for diverse purposes.
5. The New Review of Hypermedia and Multimedia 2001 “Denotative and Connotative Semantics in Hypermedia: Proposal for a Semiotic-Aware Architecture.” Co-authored with Hardman, L.

   In this article we claim that the linguistic-centred view within hypermedia systems needs refinement through a semiotic-based approach before real interoperation between media can be achieved and propose an architecture for a dynamic semiotic-aware hypermedia system.
6. ACM Multimedia 2001 – „Designing Annotation Before It's Needed.” co-authored with Putz, W.

   This conference paper describes the automated and semi-automated annotation of audiovisual media in a production framework that provides tools and technologies for the authorship of linear and interactive media productions, based on the example domain of news.
7. IEEE Multimedia 1999, “Everything you wanted to know about MPEG-7: Part I & II.”, co-authored with Lindsay, A.

   We provide a detailed overview of the goals and achievements of MPEG-7.
8. Multimedia Tools & Applications1997, “The Application of Video Semantics and Theme Representation in Automated Video Editing”, co-authored with Parkes, A..

   We consider the automated generation of humorous video sequences from arbitrary video material by presenting AUTEUR, an experimental system that embodies mechanisms to interpret, manipulate and generate video.

Committee membership

Chair of ACM MM ’04 Video Program, New York, Oct. 2004

Programme Committee member of ACM MM ’04 Short paper track, New York, Oct. 2004

Co-organiser and programme Committee member COSIGN ’04, Split, September 2004

Programme committee member 3rd International Conference on Entertainment Computing - ICEC 2004, University of Eindhoven, September 2004

Co-organiser and programme committee member of 3rd International Conference on Narrative and Interactive Learning Environments (NILE 2004), Edinburgh, Aug. 2004

Programme committee member RIAO 2004 – University of Avignon, April 2004

Programme Committee member of ACM MM ’03 Video Program, Berkeley, Dec. 2003

Organiser and programme Committee member of the 3rd International Conference on Computational Semiotics in Games and New Media COSIGN ’03, Teesside, September 2003

Programme Committee member of the 2nd International Conference on Technologies for Interactive Digital Storytelling and Entertainment (TIDSE ’03, Darmstadt), 24 – 26 March 2003

Co-organiser and presenter of the panel:“Media Semantics: Who Needs It and Why?“ at ACM MM ’02 Video Program, Juan-les-Pins, Dec. 2002

Technical programme committee member 4th International Workshop on Multimedia Information Retrieval (MIR 2002) held in conjunction with the ACM Multimedia Conference 2002, Juan-les-Pins, Dec. 2002

Programme Committee member of ACM MM ’02 Video Program, Juan-les-Pins, Dec. 2002Co-organiser and programme committee member of the 2nd International Conference on Computational Semiotics in Games and New Media (COSIGN 2002), Augsburg, Sep. 2002

Co-organiser and programme committee member 2nd International Conference on Narrative and Interactive Learning Environments (NILE 2002), Edinburgh, Aug. 2002

Programme committee member of HyperText 2002, University of Maryland, June 2002

Programme committee member ecir02 (24th European Colloquium on Information Retrieval Research), Glasgow, 25-27 March 2002

Programme committee member (substitute) ACM MM 2001, Ottawa, Canada, Sep. 2001

Local Chair, organiser/Co-founder and programme committee member of 1st International Conference on Computational Semiotics in Games and New Media (COSIGN 2001), 10 -12 Sep.2001, Amsterdam, NL

Editorial board member of the IEEE MM journal, from June 2001 - present

Co-organizer and programme committee member 1st International Conference on Narrative and Interactive Learning Environments (NILE 2000), 30.08 - 01.09.2000, Edinburgh, UK

Programme committee member of Digital Storytelling Conference (DISTEL 2000), 15-16 June 2000, Darmstadt, Germany

Programme committee member and session chair RIAO 2000 - Content based multimedia information access,12. - 14.04 2000, Paris, France.

Organiser and programme committee member AISB 99 Symposium on "AI and Creativity in Entertainment and Visual Art", 8th and 9th of April 1999, Edinburgh – The Society of Artificial Intelligence and the Simulation of Behaviour (AISB)

Chair of the MPEG-7 DDL group (February 1998 – March 1999), Co-chair from March 1999 to October 1999, since then active member

Editorial board member of the MPEG-7 group (Requirements Document and the Context & Objectives Document), from September 1997 to March 1999

Tutorials and workshops

Co-organiser and presenter of ACM MM full day Tutorial "Understanding Media Semantics", 03.11.2003, Berkeley, USA

Co-chair of the 1st ACM MM workshop on Experiential Telepresence (ETP 03), 07.12.2003, Berkeley, USA

Organiser and presenter of COSIGN full day Tutorial "Computational Semiotics in Games and New Media", 03.11.2003, Berkeley, USA

Co-organiser and presenter of the ACM MM '99 full day Tutorial „The MPEG 7 Challenge, A Critical Review", 31.10.1999, Orlando, USA

Co-organiser and presenter of the ICMCS '99 full day Tutorial "Mpeg-7: Concepts, Terminology and Requirements", 07.07.1999, Florence, Italy

Organiser and programme committee member ECAI 1998 WS „AI/ALife and Entertainment", August 1998, Brighton, UK

Co-organiser of IEEE MultiMedia Systems 98 Workshop on „Supporting Video Production: What is Possible? ", 30.06.1998, Austin, USA

Co-organiser and programme committee member CHI Workshop on „Innovative Interface Metaphores for Visual Media", April 18-23, 1998, Los Angeles, USA

Invited talks, lectures and seminars

Fachhochschule Darmstadt – Multimedia System Design (MSD). Lecture on "AV Recording and Postproduction", 23.06.2003

IBM Academic Workshop on „Life Science", 31.03 – 01.04.2003, IBM Böblingen, Germany - S.M. Eisenstein or the Art of Movie Viewing.

University of Amsterdam, Advanced School for Computing and Imaging (ASCI) – Multimedia Retrieval, 21.02.2003 - Standardization through MPEG-7

DigiCULT Forum 3, Expert Round Table, XML: Towards an Interoperable Semantic Web for Heritage Resources, 21st of January, 2003, FHG-IPSI, Darmstadt

Eindhoven University of Technology (TU/e), Werkgemeenschap voor Informatie- en Communicatietheorie in de Benelux (WIC) IEEE Benelux Section, Midwinter Meeting 2002 on MULTIMEDIA RETRIEVAL, 14 January 2002 : Standardization Efforts in the area of Multimedia Retrieval: Is MPEG-7 the final solution?

International Symposium „Computer Graphics -Enabling Technology for the Information Society“, Monday, May 28th, 2001, Fraunhofer Institute for Computer Graphics, Darmstadt, Germany - Do Virtual Beings Need Psychotherapy?

IST Diffuse Conference, 7th March 2001, Brussels (http://www.diffuse.org/event1.html) - The Semantic Web - Developing a Library of Alexandria for the 21st Century?

IBM T. J. Watson Research Center, Hawthorne, NY, US, 06.11.2000 Whereof One Cannot Speak Thereof One Must Remain Silent

University of Surrey, Guildford, Surrey, UK, 28.06.2000, A New Paradigm for Video Media

WS Semantics for the WEB, Dagstuhl,Germany, 19.03.-24.03.2000, MPEG-7: Semantics for Audio-Visual Media on the Web

WWW9 Workshop: Multimedia on the Web, Amsterdam, 15.05.2000 - Streaming Metadata

University of Amsterdam, Research Institute Computer Science, May 2000, MPEG-7: Semantics for Audio-Visual Media.

10th DELOS Workshop on Audio-Visual Digital Libraries, Santorini, Greece, 24-25 June 1999. – Everything you always wanted to know about MPEG-7 but were afraid to ask.

Verband der Elektrotechnik, Elektronik und Informationstechnik (VDE) – Hanau, Germany, “Multimedia – Eine Herausforderung für Ingenieure und eine Chance für die Gesellschaft”, 4.3. 1999.

ÖFAI, Vienna, November 1998 - Generierung von Slapstick? Das ich nicht lache!

IMIS, Universität zu Lübeck, November 1998 - Inhaltsbeschreibungen audio-visueller Medien im Rahmen von MPEG-7,

ACM MM ’98, Bristol, UK September 14, 1998 - MPEG-7 : An Overview

HHI, Berlin, August 1998 - Metadaten für audio-visuelle Medien: MPEG-7

Computing Department, Cornell University, Ithaca, NY, April, 1998 - Approaches on Intelligent Video Production

Media Lab - Interactive Cinema Group, MIT, Cambridge, MA, April 1998 - It’s not Chaplin, but…

ICSI, Berkeley, CA, April 1998 - Innovative Interface Metaphores for Visual Media

DFKI, Saarbrücken, December 1996, The Application of Video Semantics and Theme Representation in Automated Video Editing.

Göteborgs Universitet , Informatik, November 1996 - AUTEUR: The Application of Video Semantics and Theme Representation for Automated Film Editing

Publications

Nack, F. & Putz, W. (2004). Saying What It means: Semi-automated (News) Media Annotation. To appear in Multimedia Tools and Applications.

Nack, F., v. Ossenbruggen, J. & Hardman, L. (2004). That Obscure Object of Desire: Multimedia Metadata on the Web (Part I and Part II). To appear in IEEE Multimedia.

Kateryna Falkovych, Frank Nack, Jacco van Ossenbruggen, Lloyd Rutledge (2003). SampLe: Towards a Framework for System-supported Multimedia Authoring, To appear in Proceedings of Multimedia Modeling Conference 2004.

Nack, F. (2003) Mobile Media. IEEE MultiMedia, Vol 10, No. 2, pp 8 - 11.

Nack, F. (2003) Aesthetics of Contradiction. IEEE MultiMedia, Vol 10, No. 1, pp.11 – 13.

Nack, F. (2003) Capturing experiences – a matter of contextualising events. In Proceedings of 1st ACM MM workshop on Experiential Telepresence (ETP 03), 07.12.2003, Berkeley, USA, pp. 53 - 64

Nack, F., Manniesing, A, & Hardman, L. (2003) Colour picking - the pecking order of form and function.. Proceedings of the 11th ACM International Conference on Multimedia, Berkeley, CA, USA, November 2-8, 2003, pp. 279 – 282.

Nack, F., Hardman, L., & v. Ossenbruggen, J. (2003). Semantic enabled presentation of information. In Proceedings of 5th DELOS Workshop on Multimedia Contents and Digital Libraries, Chania, Crete, Greece, 3-4 June, 2003.

Mitchell, G., Clark, A., Nack, F., Fencott, C., & Lindley, C. (2003) Computational Semiotics – A Growing Interdisciplinary Field. Proceedings of 3rd Conference on Computational Semiotics for Games and New Media, 10 - 12 of September 2003, pp. 1 - 5, Teesside, UK.

Kateryna Falkovych, Frank Nack, Jacco van Ossenbruggen, Lloyd Rutledge (2003). Semantics in Multi-facet Hypermedia Authoring, Hypermedia and the Semantic Web workshop at the 14th Conference on Hypertext and Hypermedia, September 30, 2003.

Nack, F. (2002). Pictures at an exhibition. IEEE MultiMedia, Vol 9, No. 2, pp.14 - 17.

Nack, F. (2002). From Ontology-based Semiosis to Computational Intelligence - The Future of Media Computing. Book chapter in Media Computing Computational Media Aesthetics, Chitra Dorai and Svetha Venkatesh, Editors, pp. 159 – 196, Kluwer Academic Publishers, June 2002.

Nack, F. (2002). Media Information Spaces-A Semantic Challenge. IEEE Intelligent Systems, January- February 2002, pp. 81 - 83.

Nack, F. and Hardman, L. (2002) Towards a syntax for multimedia semantics. CWI Technical Report INS-R0204, April 2002.

Chitra Dorai, Frank Nack, Andreas Mauthe, Lloyd Rutledge, Thomas Sikora, Herbert Zettl (2002).Media Semantics: Who Needs It and Why? In Proceedings of ACM MM '02 ,pp 580 - 583, Juan-les-Pins, Dec. 1-6, 2002

Lindley, C., Nack, F., Andre, E., Clark, A., Mitchell, G. & Fencott, C. (2002) The Emergence of the Labyrinth: The Intrinsic Computational Aesthetic Form. Proceedings of 2nd Conference on Computational Semiotics for Games and New Media, 02 - 04 of September 2002, pp. 3 - 6, Augsburg, Germany.

Nack, F. (2001). Play the game. IEEE MultiMedia, Vol 8, No. 1, pp. 8-10

Nack, F. & Putz, W. (2001). Designing Annotation Before It's Needed. In Proceedings of the 9th ACM International Conference on Multimedia, pp. 251 - 260, Ottawa, Canada, Sept. 30 - Oct. 5, 2001. to appear in ACM MM 2001 - Ottawa, Canada, Sept. 30-Oct. 5, 2001

Nack, F., Windhouwer, M., Hardman, L., Pauwels, E., & Huijberts, M. (2001). The Role of High-level and Lowlevel Features in Style-based Retrieval and Generation of Multimedia Presentations. The New Review of Hypermedia and Multimedia 2001, Vol. 7, pp. 7 - 37.

Nack, F. & Hardman, L. (2001). Denotative and Connotative Semantics in Hypermedia: Proposal for a Semiotic-Aware Architecture. The New Review of Hypermedia and Multimedia 2001, Vol. 7, pp. 39 - 65.

Lindley, C. & Nack, F. (2001). Categorical, Narrative and Hybrid Behaviour Generation in the GENIE Environment for Interactive Narratives in Virtual Worlds. Proceedings of International Conference on Media Futures, 08. - 09 of May 2001, pp. 65 - 68, Florence, Italy

Lindley, C., Nack, F., Clark, A., Mitchell, G. & Fencott, C. (2001). New media semiotics - computation and aesthetic function Proceedings of 1st Conference on Computational Semiotics for Games and New Media, 10 - 12 of September 2001, pp. 3 - 8, Amsterdam, The Netherlands.

Nack F. (2000). All content counts - the future in digital media computing is meta. IEEE MultiMedia, Vol 7, No. 3, pp. 10 - 13

Nack F. (2000). Catch me, said the meaning, and turned out to be a hydra. In Proceedings of Workshop on Narrative and Interactive Learning Environments, pp. 67 – 74, 30th August - 1st September 2000, Edinburgh, Scotland

Nack F. (2000). About the influence of computer semiotics on communal Intelligence. Workshop on Computational Semiotics for New Media, 29-30 June 2000, University of Surrey, Guildford, Surrey,UK

Nack, F. & Lindley, C. (2000). Production and maintenance environments for interactive audio-visual stories. Proceedings ACM MM 2000 Workshops - Bridging the Gap: Bringing Together New Media Artists and Multimedia Technologists, pp. 21 - 24, October 31, 2000 Los Angeles, CA.

Nack, F. & Lindley, C. (2000). Arbeitsumgebungen für die Entwicklung interaktiver Geschichten. Computer Graphik Edition – Band 2; Digital Storytelling (Tagungsband), pp 113 - 125. Hrsg: Ulrike Spierling. Frauenhofer IRB Verlag

Nack, F. & Putz, W. (2000). Semi-automated Annotation of Audio-Visual Media in News. GMD-Report Nr. 121, GMD - Forschungszentrum Informationstechnik, Sankt Augustin, Germany, Dezember 2000.

Dittmann J. & Nack F. (2000). Copyright - Copywrong IEEE MultiMedia, October - December 2000, Vol. 7, No. 4, pp. 14 - 17

Lindley, C. & Nack F. (2000). Hybrid Narrative and Associative/Categorical Strategies for Interactive and Dynamic Video Presentation Generation. New Review of Mypermedia and Multimedia 2000, edited by Lynda Hardman, pp. 111 - 145.

Nack, F. and Steinmetz, A. (1999). Der kommende Standard zur Beschreibung multimedialer Inhalte – MPEG-7. Der FernmeldeIngenieur – Zeitschrift für Ausbildung und Fortbildung', Heft 3, März 99, Verlag für Wissenschaft und Leben Georg Heidecker GmbH, Erlangen.

Nack, F. & Lindsay, A. (1999). Everything you wanted to know about MPEG-7: Part II. IEEE MultiMedia, October - December 1999,pp.64-73, IEEE Computer Society.

Nack, F. & Lindsay, A. (1999). Everything you wanted to know about MPEG-7: Part I. IEEE MultiMedia, July – September 1999,pp. 65 - 77, IEEE Computer Society.

Hunter, J. and Nack, F. (1999). "An Overview of the MPEG-7 DDL Proposals", Signal Processing: Image Communication Journal, Special Issue on MPEG-7, Vol. 16, pp 271-293, 2000.

Fries, G.; Paradiso, A.; Nack, F.; Schumacher, K.(1999). A Tool for Designing MPEG-4 compliant Expressions and Animations on VRML Cartoon Faces. In: Dominic W. Massaro (Ed.): Proceedings of AVSP '99, Auditory-Visual Speech Processing. International Conference, Santa Cruz, California, USA, August 7 - 10, 1999. pp. 145 - 150.

Paradiso, A.; Nack, F.; Fries, G.; Schuhmacher, K. (1999). The Design of Expressive Cartoons for the Web – TINKY. Proceedings of IEEE Multimedia Systems 99 (ICMCS '99), Vol.1, pp 276 – 281, Florence, Italy, June 7-11, 1999.

Nack, F. and Steinmetz, A. (1998). Approaches on Intelligent Video Production. Proceedings of ECAI-98. Workshop on AI/Alife and Entertainment, pp. 48 - 56, Brighton, UK, August 24, 1998.

Nack, F., Steinmetz, A., Dittmann J., Wilk, C. (1998). A4SM, A Framework for Distributed Video Production. Proceedings of SYBEN 98, pp. 466 - 475, Hotel Mövenpick, Zürich, Switzerland, 18-20 May 1998.

Dittmann, Jana; Nack, Frank; Steinmetz, Arnd; Steinmetz, Ralf (1998). Interactive Watermarking Environments , Proc. IEEE Multimedia Systems Conference '98, Austin, Texas, pp 286-294

Nack, F. (1997). Verstehen Sie Spaß? Betrachtungen zu Humor in der Mensch-Maschine-Kommunikation. Workshop KI-Techniken für intelligente Mensch-Maschine-Schnittstellen, 21. Deutsche Jahrestagung für Künstliche Intelligenz, Freiburg, 10. September, 1997.

Nack, F. (1997). Considering the Application of Agent Technology for Collaboration in Media-Networked Environments. Proceedings of IRIS20 - Social Informatics, Part 2, pp. 867 - 884, Hankø Fjordhotel, Norway, August 9-12, 1997.

Nack, F. and Parkes, A. (1997). Towards the Automated Editing of Theme-Oriented Video Sequences. Applied Artificial Intelligence (AAI) [Ed: Hiroaki Kitano], Vol. 11, No. 4, pp. 331-366.

Nack, F. and Parkes, A. (1997). The Application of Video Semantics and Theme Representation in Automated Video Editing. In Multimedia Tools and Applications, [Ed: Zhang, H.], Vol. 4, No. 1, pp 57 - 83.

Nack, F. (August 1996). AUTEUR: The Application of Video Semantics and Theme Representation for Automated Film Editing. Ph.D. Thesis, Lancaster University

Nack, F. and Parkes, A. (1995). AUTEUR: The Creation of Humorous Scenes Using Automated Video Editing. Proceedings of IJCAI-95 Workshop on AI Entertainment and AI/Alife, pp. 82 - 84, Montréal, Canada, August 19, 1995.

Nack, F. and Parkes, A. (1995). Automated Film Editing for Educational Applications? Don't make me laugh! Proceedings of ED-Media 95 - World Conference on Educational Multimedia and Hypermedia, pp. 482 - 487, Graz, Austria, June 17 - 21, 1995.

Parkes, A. , Nack, F. and Butler, S. (1994). Artificial intelligence techniques and film structure knowledge for the representation and manipulation of video. Proceedings of RIAO '94, Intelligent Multimedia Information Retrieval Systems and Management, Vol. 2, Rockefeller University, New York, October 11-13, 1994.

Languages

German (native), English (fluent), Dutch (intermediate), French (basic), Swedish (basic)

References

Dr. Werner Kriechbaum
IBM Digital Media Solution Centre
Postfach 1380
D-71003 Böblingen
Germany
Phone: Office 1: +49/7073/500582
Fax: Office 2: +49/7031/163318
Email: kriechba@de.ibm.com

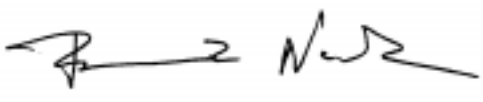
Prof. Marc Davis
School of Information Management and Systems
University of California at Berkeley
South Hall 102
Berkeley, CA 94720-4600
Phone: +1 510 643-2253
Fax: +1 510 642-5814
Email: marc@sims.berkeley.edu

Prof. Dr. M.L. Kersten
CWI, INS-1
Kruislaan 413
P.O. Box 94079
1090 GB Amsterdam
Netherlands
Phone: +31 20 592 4066
Fax: +31 20 592 4312
Email: Martin.Kersten@cwi.nl

Prof. Dr. Lynda Hardman
CWI, INS-2
Kruislaan 413
P.O. Box 94079
1090 GB Amsterdam
Netherlands
Phone: +31 20 592 4147
Fax: +31 20 592 4312
Email: Lynda.Hardman@cwi.nl

Dr. Paul Brna
School of Computing and Mathematics
Ellison Building
Northumbria University
Newcastle upon Tyne NE1 8ST
UK
Phone: +44 191 227 3902
Fax: +44 191 227 3662
Email: Paul.Brna@northumbria.ac.uk

Prof. Dr. Erich J. Neuhold
Fraunhofer-IPSI
Dolivostrasse 15
64293 Darmstadt
Germany
Phone: +49 6151 / 8 69 - 8 02
Fax: +49 6151 / 8 69 - 9 69
Email: neuhold@ipsi.fraunhofer.de



December 2003

Appendix 2: Formal letter of acceptance from the Host Institution

With reference to the "Host Institution Declaration" (EURYI Application Form 3) the Stichting Centrum Wiskunde en Informatica confirm that they are prepared to host the applicant, dr. F.M. Nack, and guarantee the required access to equipment, facilities and resources.

Yours sincerely,
Stichting Centrum voor Wiskunde en Informatics

Prof. Dr. J.K. Lenstra
General manager

This is for the electronic version only: The signature on this form as well as those required on the applicant declaration and host institution declaration in part A are only provided on the paper version, submitted on 15/12/2003. The paper document also contains the two letters of recommendation.