



PreMaDoNA Project Management

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logicaCMG

TU/e

PHILIPS

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Content



- People
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- Aim
- Major expected results
- Application drivers
- Organisation

People (applicants, partners)



- Applicants (TUE)
 - Henk Corporaal
 - Jef van Meerbergen
 - Bart Mesman
 - Jeroen Voeten
- Partners
 - Peter de With (LogicaCMG)
 - Albert van de Werf (Philips Research)
 - Rene van den Berg (Philips semiconductors, BL car radio ITS)
 - Rob Woudsma (Philips Semiconductors, BL mobile communications)
 - Bart Barenbrug (Philips Research)

People (working)



- Working internally
 - Track 1:
 - Track 2: Bart Mesman, Bart Theelen
 - Track 3:
- Working externally
 - LogicaCMG: Milan Pastrnak
 - Philips Nijmegen, BL CarITS: Arno Moonen
 - Philips Nijmegen, Business Unit Mobile Communications (BUMC):
- Not yet assigned:
 - Desingh
 - Akash



Cooperation model, partners

- 1 PhD working part-time at
 - partner location
 - TUE
- Communicates between partners and TUE:
 - partner-> TUE: Knowledge wrt application, architecture, product requirements, design practice, bottlenecks
 - TUE-> partner: Knowledge wrt analysis, solutions, tools
- Study application/architecture provided by partner

Cooperation Progress



- Potential integrated design flow with Scalp
 - Investigate SP-graphs as specification/front-end for Premadona
- Scalp & Artemisia
 - Discussing common application driver for benchmarking

Cooperation, Philips research



- Reuse of network components, synthesis tool, and simulator (Aethereal, Hijdra, MRM)

Aim



Being able to design NoC-based real-time systems in a predictable way, such that we can guarantee non-functional requirements, while being able to dynamically match quality versus available resources.

Major expected results, track 1



- The architecture in terms of *services* (APIs)
- An implementation
- Computational model of the architecture for mapping purposes
- Prototype realisation on an FPGA board.
- Mapping of two applications, FM radio and Graphics Texture Mapping
- Resource Manager

Major expected results, track 2



- Mapping methodology aimed at reducing the number of design iterations
- A computational model of the application
- Timing analysis tool
- Embedded within a complete design flow
- Modelling of two applications, FM radio and Graphics Texture Mapping

Major expected results, track 3

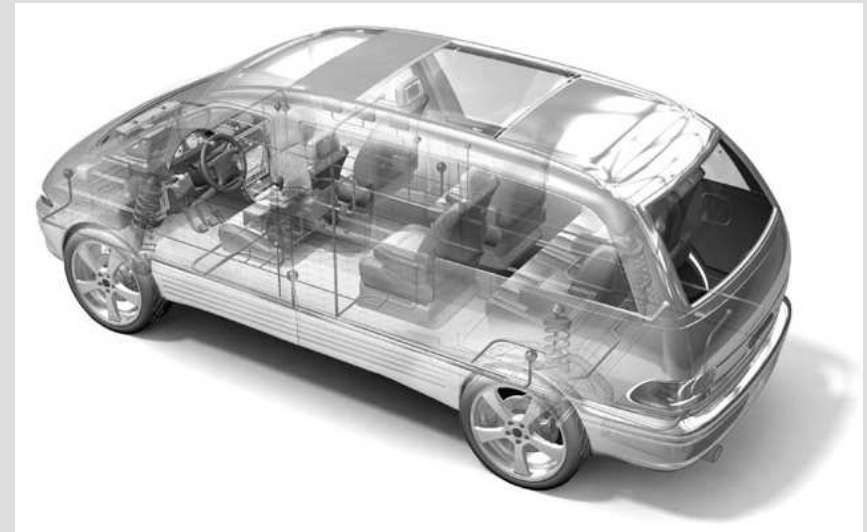


- Scalable video object-coding (MPEG-4), running on our architecture which shows:
 - That our predictable design methodology saves a lot of design iterations.
 - That NoCs can be used as an adequate target for real-time video applications.
 - That application demands can be matched with the available NoC resources dynamically. Video quality should gracefully reduce when resources are limited.
- A QoS protocol and implementation allowing the application (local manager) to negotiate with the global manager.
- A complete modelling and mapping of video object-coding running on our NoC

Caracas: Cardinal use cases overview

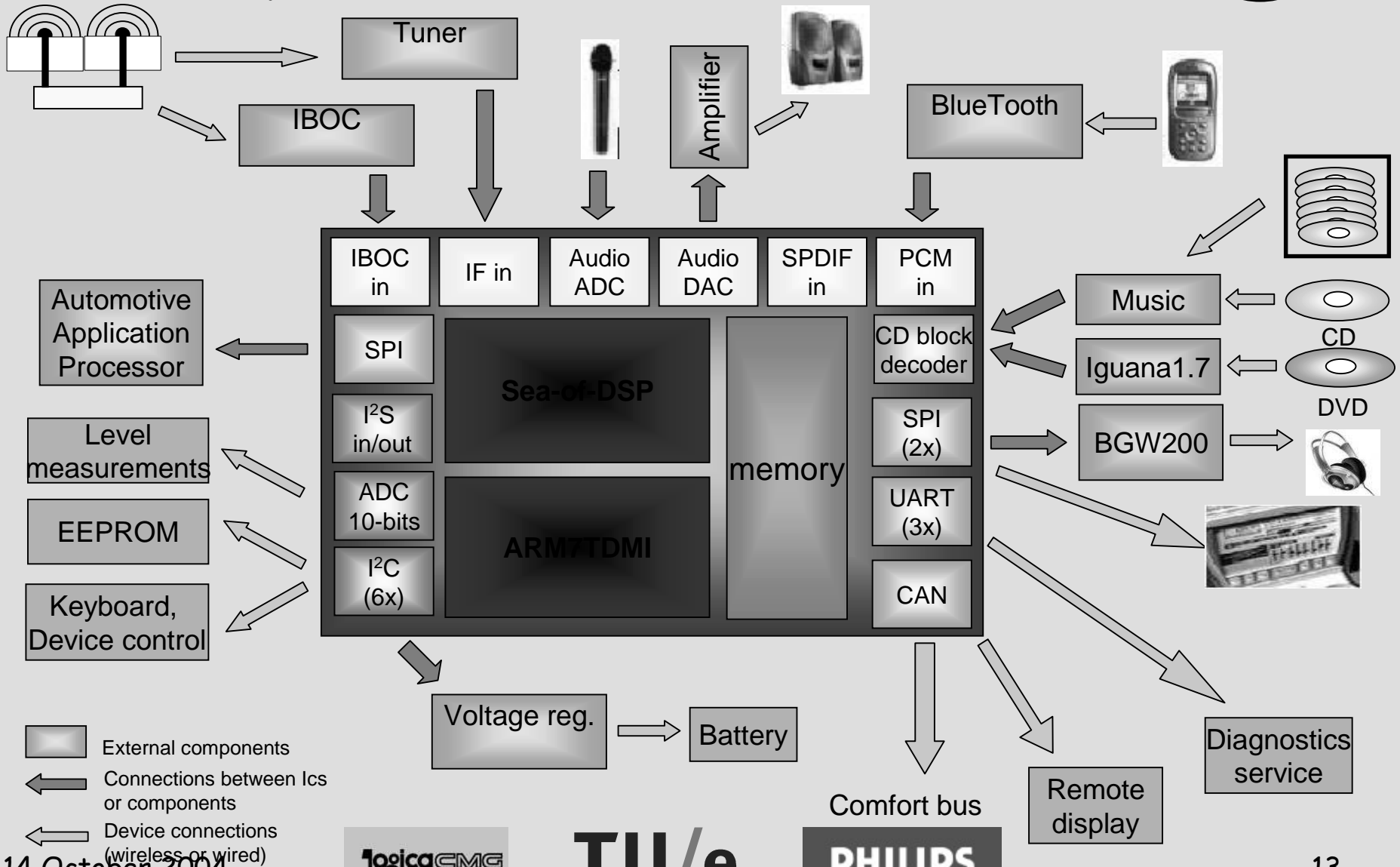


- *Radio reception*
 - *AM/FM, HD radio*
- *Audio playback*
 - *CDDA, MP3, WMA playback*
 - *CD, CD-changer, DVD*
- *Dual media*
 - *Radio + Audio (front vs rear)*
- *Connectivity*
 - *BlueTooth*
 - *Wifi*
 - *USB*





Cardinal System overview

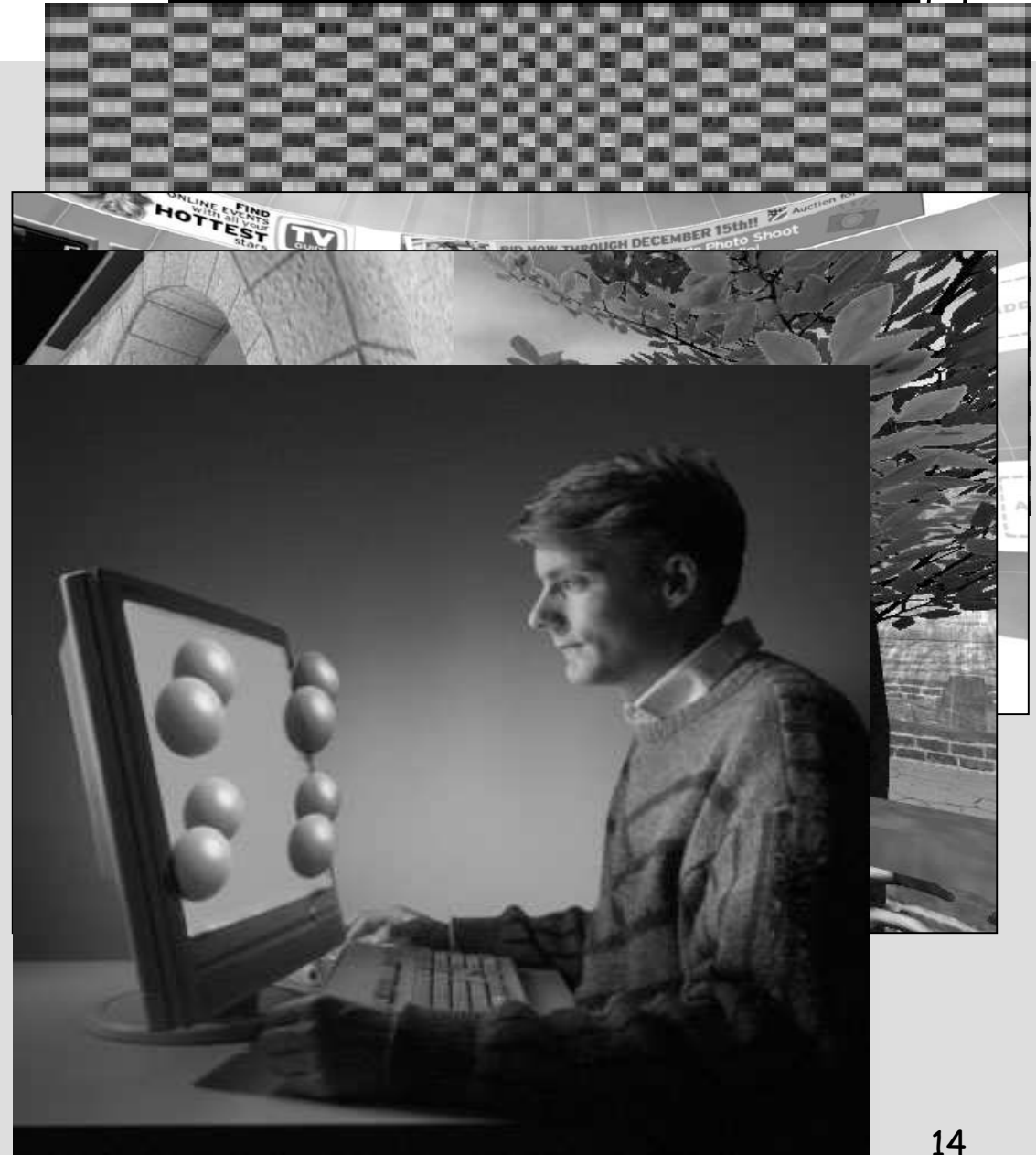


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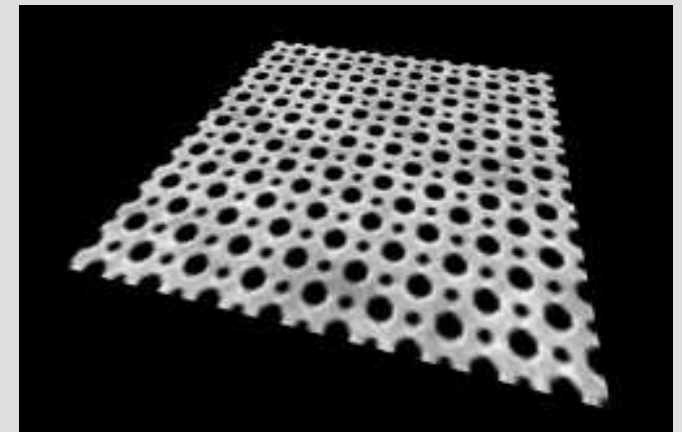
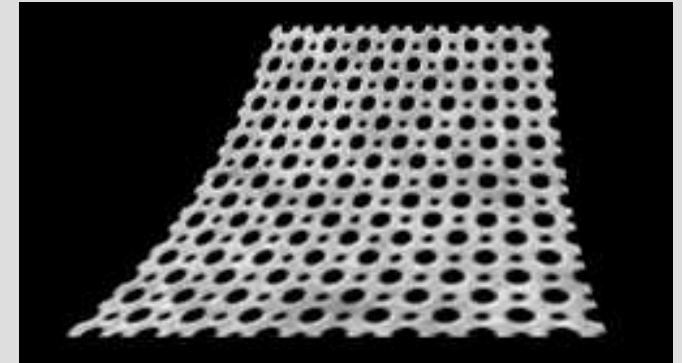
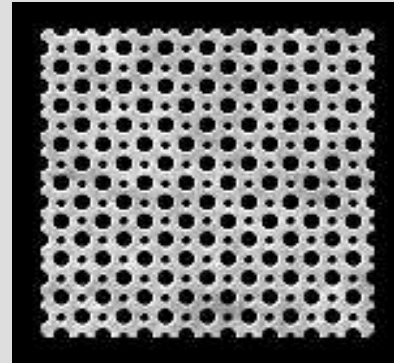
Scaler used in:

- Video scaling for TV
- Video scaling in TV (panoramic stretch)
- User interfaces
- Graphics rendering (texture filter)
- Rendering for 3D displays





Application: graphics video scaler



- H-scaling + V-scaling
- Variable data rates
- Several communicating processes

Application domain: Smartphones



- Driver application/architecture has to be defined.

What do we do for our partners?



- Analyse bottlenecks in
 - Architecture
 - Mapping
 - Design flow
- Perform the mapping on NoC, thereby testing, evaluating, and demonstrating our predictable design flow, both design-time and run-time
- Offer our deliverables (methods, tools)

Organisation



- Weekly meetings (small)
- 2-weekly meetings (large)
- Progress reports
- User committee meetings (every 1/2 year)
- Progress workshop

Our slogan



Sense and Predictability