

Current Research in Pervasive Computing

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Overview

- **CoolTown** (HP): Web presence
- **PEN** (AT&T Research Cambridge): Ad hoc pervasive computing
- **Fabric Area Networks** (Starlab): Wearable computing to the max!
- **DABWeb** (IBM Research Zürich): Datacasting via DAB

CoolTown

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 - **Locality:** CoolTown: Deliver web resource in local context

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- **Goal: Extend web model to support pervasive, non-desktop computing**

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 - RF & IR Beacons: low power beacon devices communicating with PDAs
 - Electronic tags: passive RFID tags
 - ◆ Around 100 bits, low cost, 10cm range

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 - ◆ Example: **Building: Tourist information, survey data, mortgage data**

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- Annotating/commenting contexts for information sharing (art class)

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 - Contexts: Web spaces mapped to real world
- Pragmatic yet powerful approach to nomadic pervasive computing

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- **Modular architecture:** Utilize simple information sources

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- **PEN: Providing pervasive access to these embedded components via wireless technology**

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- Keep it as simple as possible
 - All nodes transmit and receive on same frequency
 - **Low channel utilization**
 - Simple modulation
 - **Restricted range of 5m**

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- Long term rendezvous: beacon “synchronization”

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- More complex: VLSI camera modules, GPS nodes, display nodes □

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 - Proximity effects not possible
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- Missing: low cost, low range, low bandwidth, low power
- PEN addresses this need and demonstrates how it can be solved!

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 - Fabric Area Networks: **wireless communication infrastructure** for clothing

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- Solution: Short range, repeaters, & routing

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 - Bandwidth: 1-10Kbps read-write, up to 100Kbps read-only
 - Coding scheme: Manchester coding

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- Each layer can function independently of other layers

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- Interconnect to Internet/GSM via interface layer

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- Certainly an interesting & inspiring project

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 - Multiplex: up to 2Mbps bandwidth
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- Conditional access: **IBM Java Card, OpenCard middleware**

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 - "Top 20" (MP3 in data channel)



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- Pervasive Computing: Wide area, much more than can be covered in just three lectures

Stay Tuned...

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- Book recommendation: **Nicholas Negroponte: being digital (8)**
 - Though five years old, still a lot of thought provoking reading on PvC

Good bye...

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... and thanks for all the fish!

References

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