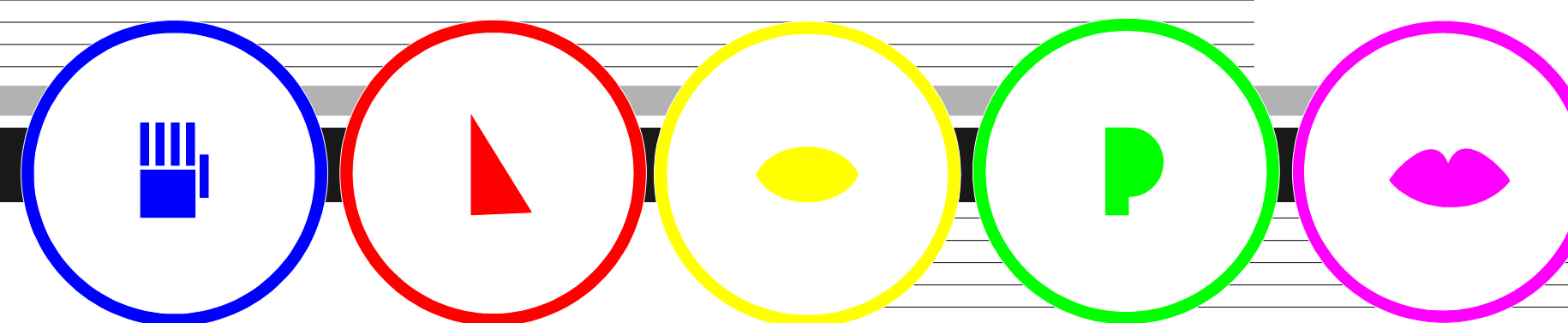


# Teaching a practical Ubicomp course using Smart-Its



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smart<sup>o</sup>its

## • Teaching a practical course content

- Ad-hoc application experiments
  - develop distributed applications,
  - address security and privacy issues
  - collect information
  - implement Smart-Its nodes and practical problems
- Context and sensors
  - Sensor technology & characteristics
  - sensors to context and algorithms
- Abstract context aware communication
  - express context for use in other applications,
  - filter and combine them into richer types of contexts
  - communicate them between applications.
- Network and energy issues
  - energy saving and energy aware protocol extensions.

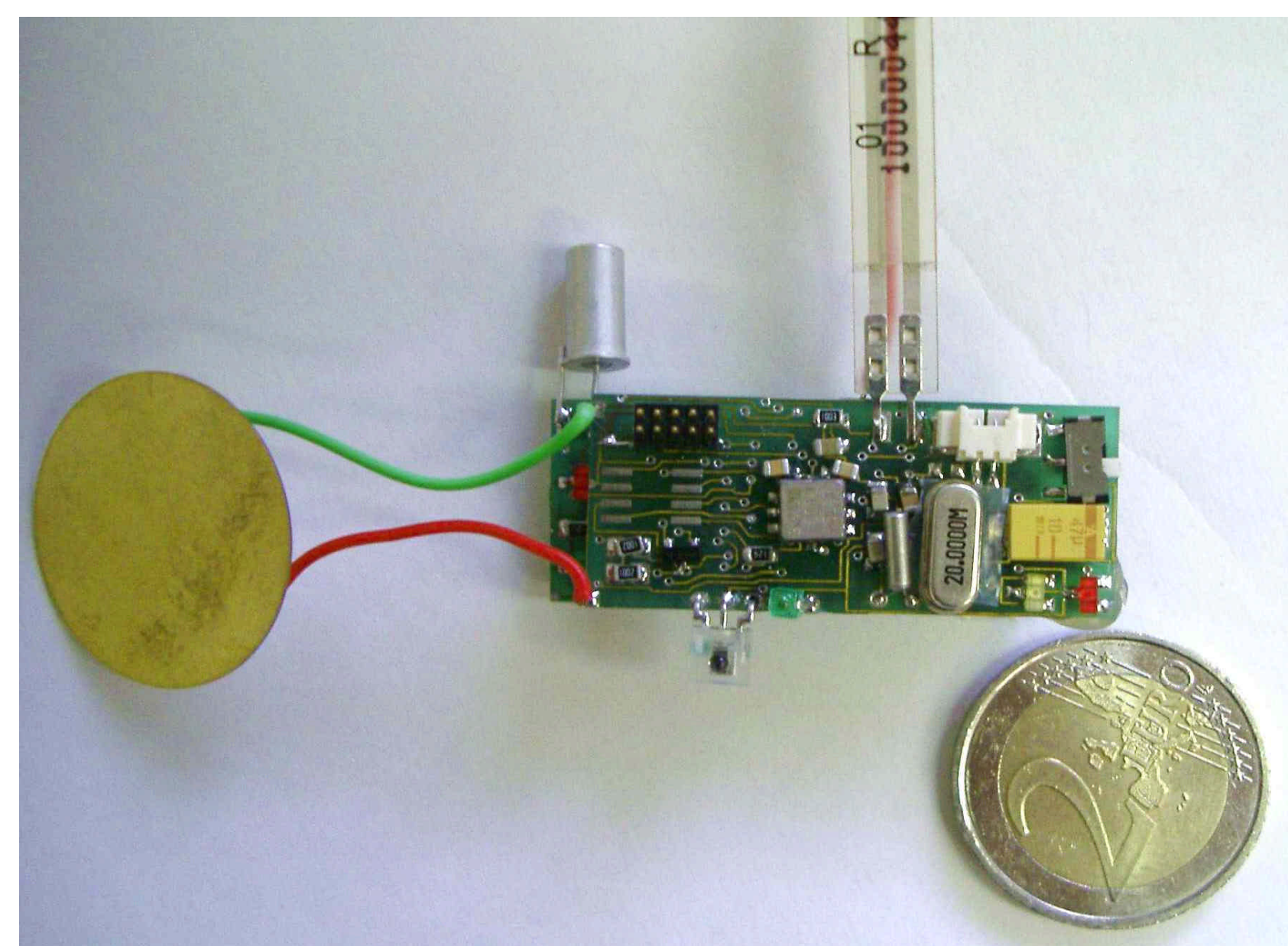
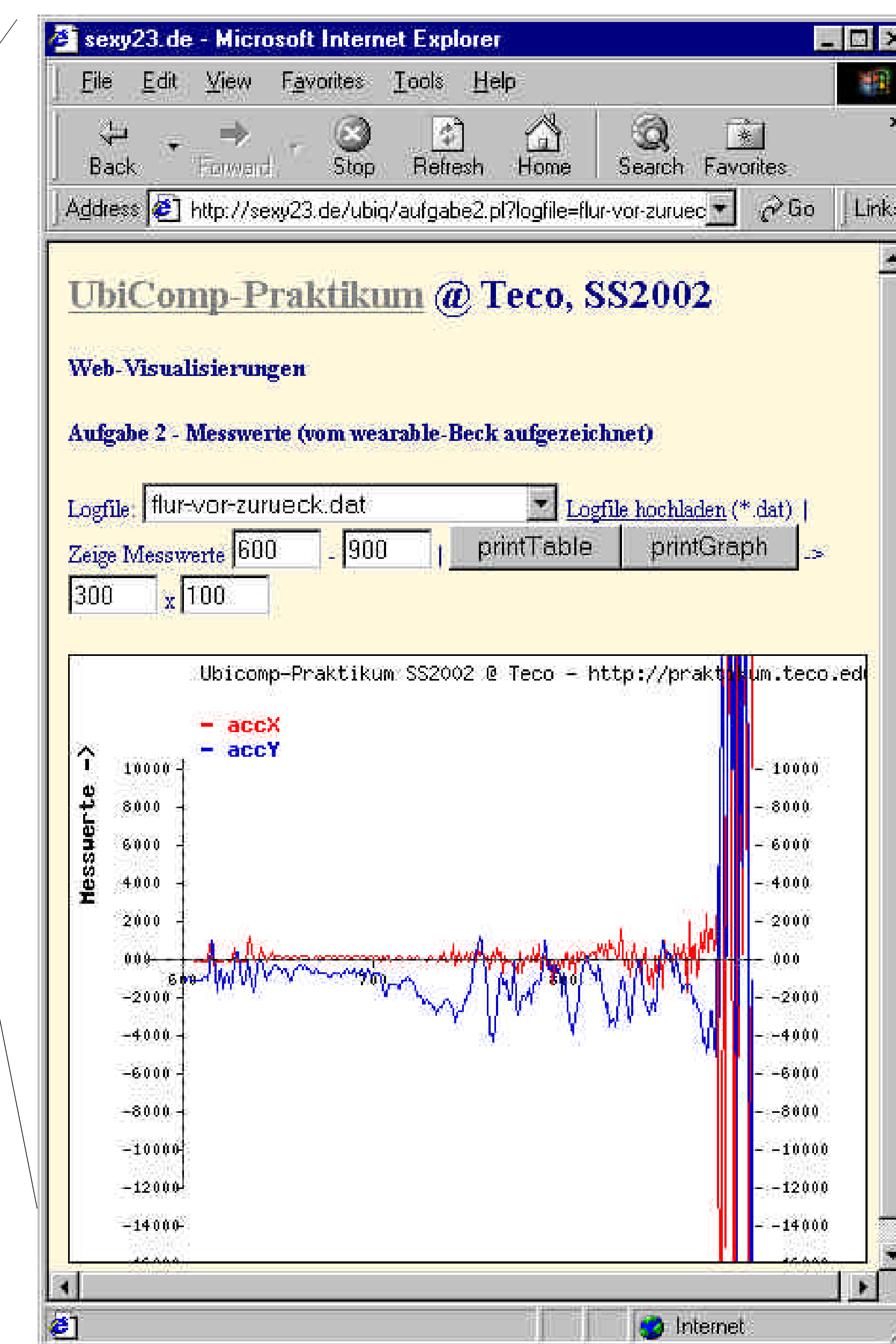
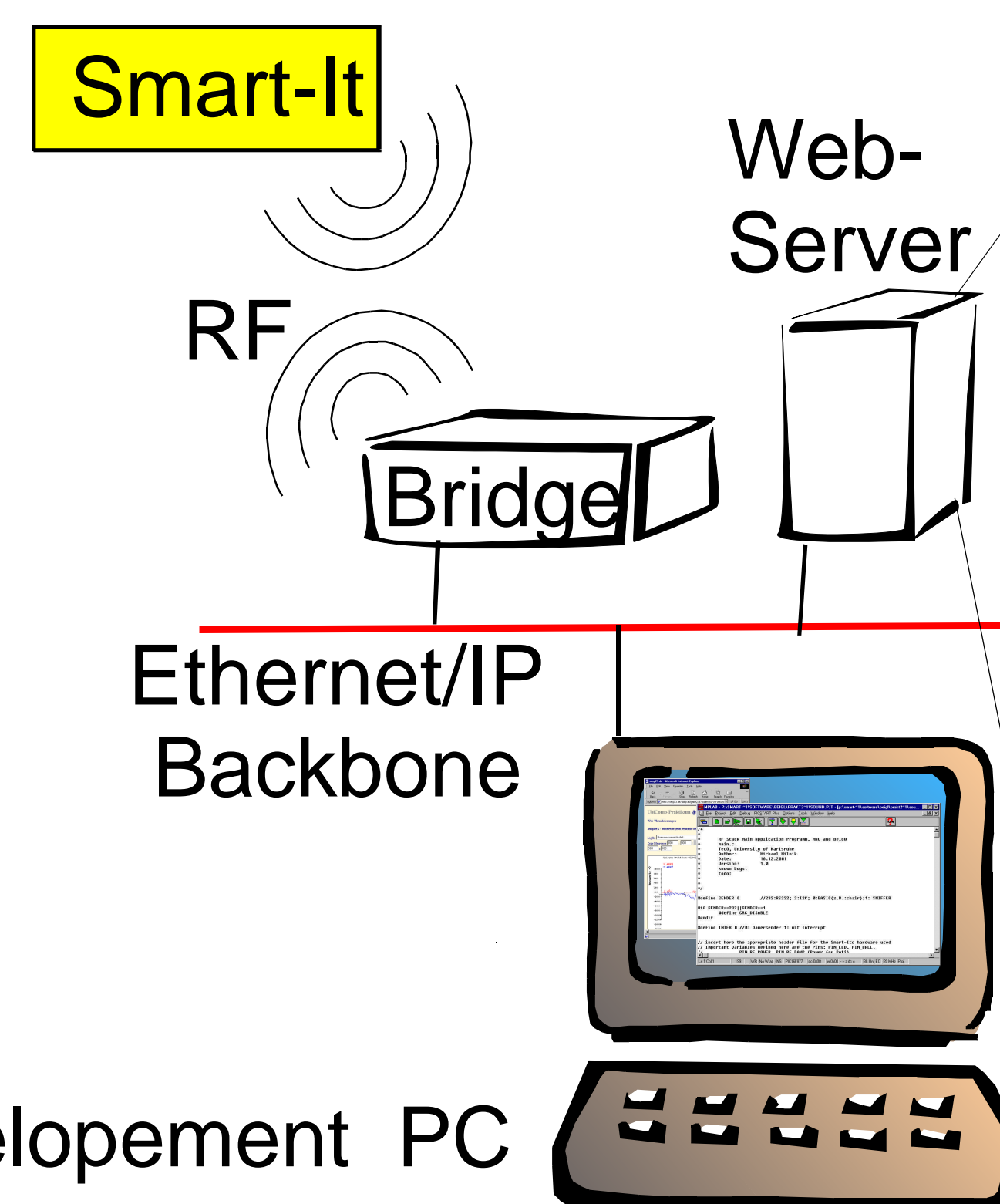
## Experiments

- Night&Day:** adjust the time-of-day setting of the Smart-It by observing the environment
- F1 Skates/1:** context from skates/kickboard had to be retrieved and communicated to a second Smart-It attached to the body of the user for output status (Figure & Video)
- F1 Skates/2:** protocol enhancement for energy aware communication of context
- Spaces of trust:** using context collected in a room to generate areas of trust and keys for exchanging documents.



## Development

- Wireless sensing & communication (Smart-Its)
- RF-Ethernet/IP bridge for communication with Development Platform
- Backend analyzer tool for sensor data
- The programming environment (also connected via Internet) Development Toolkit (SDK), compiler and wireless program download utility.



## Smart-Its

- Sensors: Acceleration, light, temperature, pressure, noise & volume
- Size: 4x1,5x1 cm
- 125 kbit/s Communication speed
- energy saving protocol, 14 ms max. latency
- 5 MIPS, 8kByte RAM, 12kByte program Flash ROM