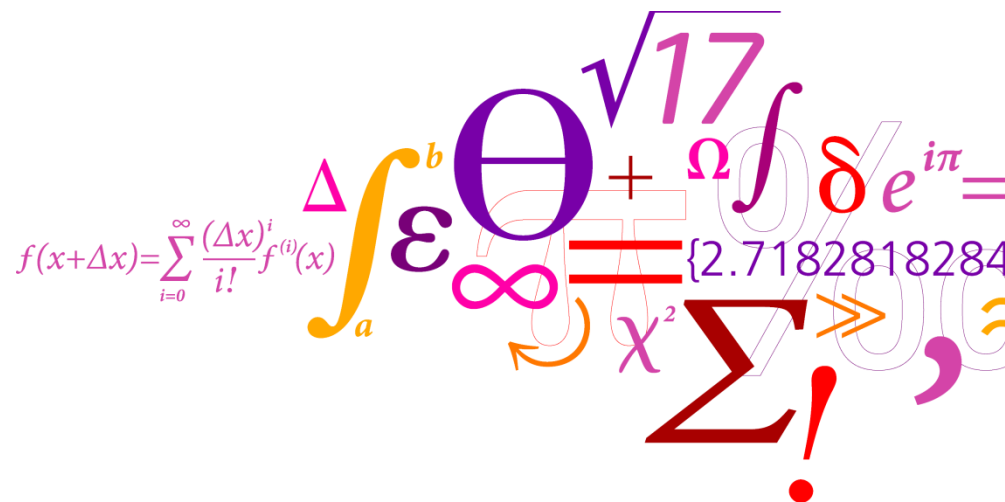


Video transmission in broadband optical-wireless links

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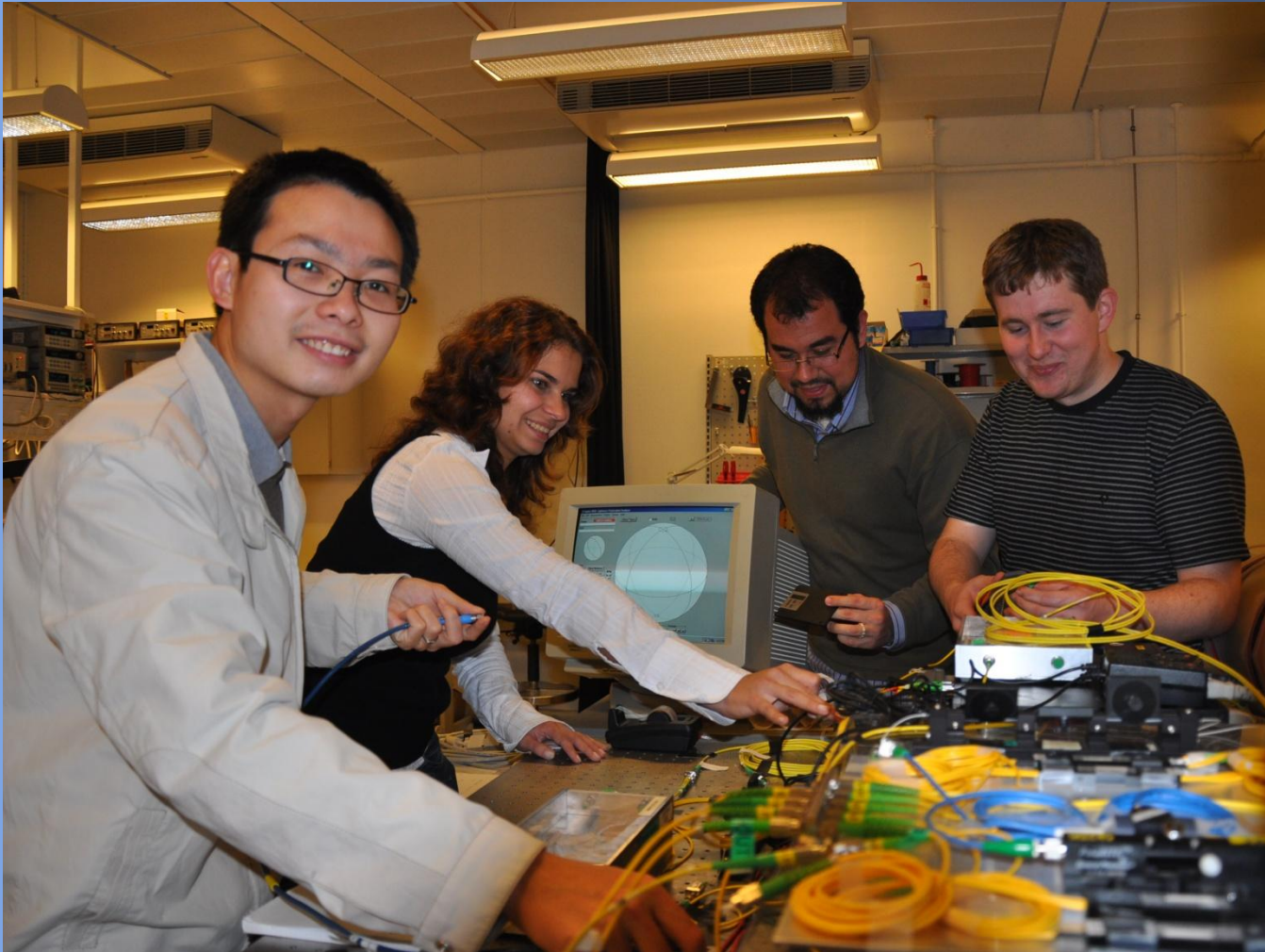
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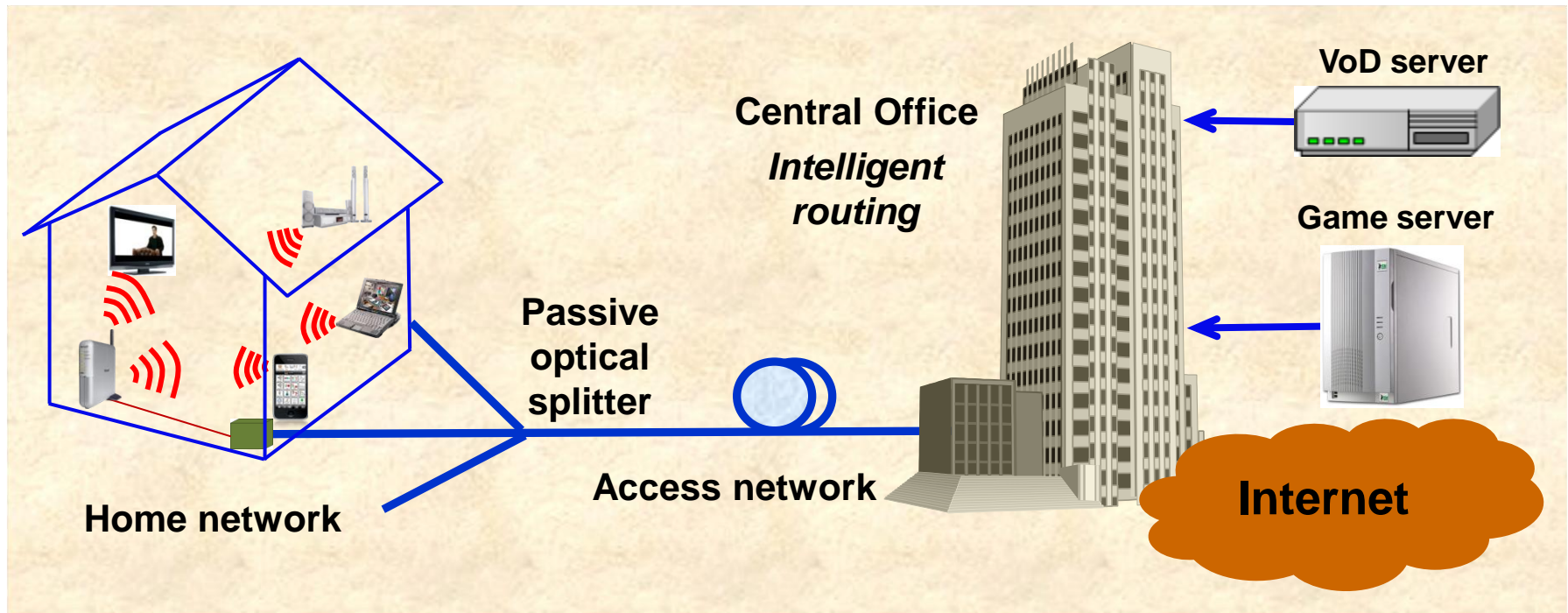


- **Motivation of our research project**
- **What do we want to achieve?**
- **Related work**
- **Proposed scheme**
- **Planned measurements and experiments**
- **Future work**

Our team!



Introduction - Scenarios



- Widespread FTTH deployment
- Broadband services: HD TV, VoD, video conference, online gaming...
- Integration of fiber and wireless (FIWI) technologies is required

- **Enabling distributed high bandwidth-demanding video services (Gaming, VoD etc.)**
- **Large allocated bandwidth for different millimeter wave signals**
 - **Gb/s wireless networking at 60Ghz and above**
- **Better security due to the limitation of signal propagation**
- **End-users demand for wireless connectivity**
 - **Higher bandwidth data transfer (USB/1394/SATA)**
 - **Enabling the transmission of uncompressed HD video**

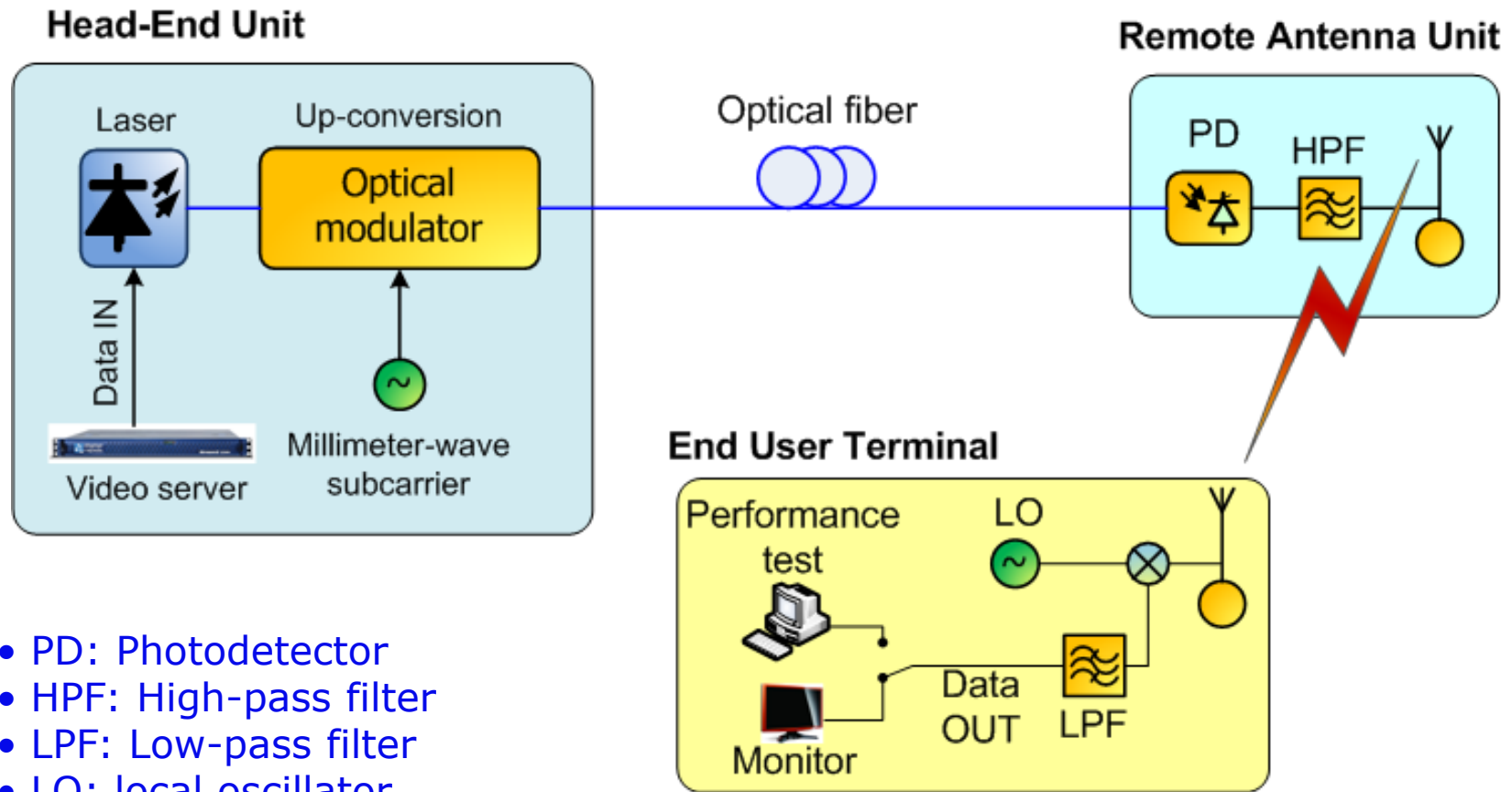
This project focuses on photonic-wireless system operating at millimeter-wave carrier frequencies

- **Seamless integration** of millimeter wave into optical system
 - Utilization of the properties of the optical fiber-wireless transmission channel to improve transmission performance
 - Utilization of high order single-carrier and multicarrier modulation formats for video transmission on mm-waves
- **Adaptation of video transmission** with required QoS (Quality of Service) to both fiber channel transmission (with low BER) and highly varying error-prone wireless channel

- **Standartization of mm-wave technology (IEEE 802.15.3c, WirelessHD group)**
- **Radio-over-fiber (RoF) systems [1-3]**
- **Optical generation of millimeter and microwave signals [4-5]**
- **Video coding and rate control [6]**

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Concept of the proposed scheme



- PD: Photodetector
- HPF: High-pass filter
- LPF: Low-pass filter
- LO: local oscillator

- **Dynamic range of the system suitable for different kinds of video applications**
- **Measuring video quality characteristics (PSNR, SSIM, etc.) for different BER regions within the wireless and optical channel**
 - **PSNR vs. Characteristics of wireless channel**
 - **PSNR vs. Characteristics of optical channel**
- **Delay introduced by network and coding schemes**

- **High order modulation formats for video transmission on millimeter waves**
- **Intelligent routing scheme in case of dual-band operation**
- **Choosing suitable compression techniques for optical-wireless channel**
- **Questions of unequal error protection in optical-wireless channel**

Your turn...

Questions?

• ***Thank you!***