

### 3.3 System Integration

System Integration
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Module Summary
Module code: STM330
Module coordinator: Prof. Dr. Thorsten Leize
Credits (ECTS): 6 Points
Semester: 3. Semester
Pre-requisites with regard to content: Bus Systems & LAN
Pre-requisites according to the examination regulations: none
Competencies: Students know the design and working principals of data exchange in internet and about the display and presentation of sensor data. They can organise, structure and store the data in different formats
Assessment: written exam 120 minutes
Usability:

Course: Efficient Video Coding
Module code: STM331
Lecturer: Prof. Dr. Christian Langen
Contact hours: 2 hours per week
Semester of delivery: summer semester
Type/mode: Experimental lecture
Language of instruction: English
Content: <ul style="list-style-type: none"> <li>• Wavelets and Filter Banks – Analogy to Fourier Series</li> <li>• The Haar Wavelet with Corresponding Filter Bank</li> <li>• Description of Filters by Impulse Response, Z Transform and Matrices</li> <li>• Multirate and Polyphase Discrete-Times Systems</li> <li>• Two-Channel Filter Bank – Conditions for Perfect Reconstruction</li> <li>• Quality Criteria of Filter Banks</li> <li>• The Lifting Scheme</li> <li>• Deslauriers-Dubuc Interpolating Filters</li> <li>• Edge Detection, Smoothing, Denoising and Image/Video Compression</li> <li>• The VC-2 Codec: Implementation of the Theoretical Concepts</li> </ul>
Recommended reading: <ul style="list-style-type: none"> <li>• Addison, Paul S.: The Illustrated Wavelet Handbook. Introductory Theory and Applications in Science, Engineering and Finance. Taylor &amp; Francis, 2002</li> <li>• Burrus, G. S.; Gopinath, R. A.; Guo, H.: Introduction to Wavelets and Wavelet Transforms. A Primer. Prentice-Hall, 1998.</li> <li>• Jensen, A.; la Cour-Harbo, A.: Ripples in Mathematics. The Discrete Wavelet Transform. Springer, 2001.</li> <li>• Mallat, S.: A Wavelet Tour of Signal Processing. The Sparse Way. Academic Press, 2008.</li> <li>• Stark, H.-G.: Wavelets and Signal Processing. An Application-Based Introduction. Springer, 2005.</li> </ul>

- Vetterli, M.; Kovancevic, J.: Wavelets and Subband Coding. Prentice Hall, 1995.
- Borer, T.: The VC-2 Low-Delay Video Codec. BBC Research & Development White Paper WH 238, August 2013.

Course: Communication and Visualisation
Module code: STM332
Lecturer: Prof. Dr. Thorsten Leize
Scope of weekly semester hours (SWS): 2
Semester of delivery: Summer semester
Type/mode: lecture with lab and assignments
Language of instruction: English
Content: <ul style="list-style-type: none"> <li>• HTTP transport</li> <li>• HTML description language</li> <li>• Javascript</li> <li>• Graphics</li> <li>• Perl scripts on the server for dynamic web pages</li> <li>• Other languages for the backend</li> <li>• Storage of data in text files, json, xml</li> <li>• Relational databases</li> </ul>
Recommended reading: see Ilias <ul style="list-style-type: none"> <li>• We work with assignments</li> </ul>