

## SM (IV CTI) - Project List 2014-2015

#	Code	Project Title	Project Description
1	P01	Procesare audio live in radio si TV	<ul style="list-style-type: none"> <li>- "drumul" parcurs de sunet intr-un post de radio (de la moderator - crainic pana la ascultator</li> <li>- tehnici de procesare - lantul de procesari ce se aplica sunetului (cu exemplificare si mai ales motivare)</li> <li>- solutii de realizare a procesarii live (de ce live ?) a sunetului (aparatura specializata, soft specializat - avantaje, dezavantaje)</li> <li>- ALGORITMI</li> <li>- acustica in studiouri de radio (cum intervine acustica in procesare audio)</li> <li>- acustica in studiourile de inregistrare</li> </ul>
2	P02	Elemente de acustica si sisteme de sunet	<ul style="list-style-type: none"> <li>- elemente de fizica acustica (teorie si exemplificari)</li> <li>- acustica mediilor inchise, forme de unde, reverberatie, unde stationare</li> <li>- acustica mono, stereo, joint-stereo, surround etc.</li> <li>- sisteme acustice (boxe, sisteme 2.1, 4.1, 5.1, 6.1, 7.1 etc), pozitionare, parametri ce determina performantele (RMS, PMPO etc)</li> <li>- standarde si sisteme de sunet: Dolby etc, THX etc, DTS etc</li> </ul>
3	P03	Standardul de compresie audio MPEG 1 Layer 3	<ul style="list-style-type: none"> <li>- psychoacoustic models, perceptual coding</li> <li>- encoding algorithm with mathematical background and examples</li> <li>- decoding algorithm with mathematical background and examples</li> <li>- audio quality</li> <li>- bit rate</li> <li>- file structure</li> <li>- ID3 tag</li> </ul>
4	P04	Standardul de compresie audio AAC+	<ul style="list-style-type: none"> <li>- encoding algorithm with mathematical background and examples</li> <li>- decoding algorithm with mathematical background and examples</li> <li>- standards / versions</li> <li>- AAC LC, SBR and Parametric Stereo algorithms with examples</li> <li>- Parametric Coding for High Quality Audio algorithm with examples</li> </ul>
5	P05	Standarde de compresie audio lossless	<ul style="list-style-type: none"> <li>- Lossless Predictive Audio Compression algorithm with mathematical background and examples</li> <li>- Lossless Transform Audio Compression algorithm with mathematical background and examples</li> <li>- True Audio algorithm with mathematical background and examples</li> <li>- Free Lossless Audio Codec algorithm with mathematical background and examples</li> </ul>
6	P06	Efecte audio	<ul style="list-style-type: none"> <li>- echo, flanger, phaser, chorus, equalization, filtering, overdrive, pitch shift, time stretching, rezonators, synthetizer, modulation, compression, 3D audio effects, reverse echo</li> <li>- toate efectele audio amintite trebuie prezentate impreuna cu suportul tehnic / matematic, exemple, sample-uri audio</li> </ul>
7	P07	Standardul de compresie a imaginilor JPEG (jpg, jpeg 2000)	<ul style="list-style-type: none"> <li>- Color space transformation, Downsampling, Block splitting, Discrete cosine transform, Quantization, Entropy coding - algorithms with mathematical background and examples;</li> <li>- Color components transformation, Tiling, Wavelet transform, Quantization, Coding - algorithms with mathematical background and examples;</li> <li>- Performanta, Exemple</li> </ul>
8	P08	Tehnici de imbunatatire a imaginilor (image enhancement)	<ul style="list-style-type: none"> <li>- size, histogram, noise reduction, removal, color change, orientation, perspective, lens correction, sharpening, slicing</li> <li>- toate tehnicile amintite trebuie prezentate impreuna cu suportul tehnic / matematic, exemple, sample-uri</li> </ul>
9	P09	Tehnologii de filmare / redare 3D (anaglyph, polarized)	<ul style="list-style-type: none"> <li>- anaglyph: Red sharpened anaglyph glasses, Anachrome filters</li> <li>- Depth adjustment</li> <li>- applications</li> <li>- Performante</li> <li>- Exemple</li> <li>- reald: liniar / circular polarization, triple flash, screen color</li> <li>- toate cele amintite trebuie prezentate impreuna cu suportul tehnic / matematic, exemple</li> </ul>

10	P10	Tehnici de procesare video live in TV	<ul style="list-style-type: none"> <li>- "drumul" parcurs de semnal (de la camera - pana la telespectator</li> <li>- tehnici de procesare - lantul de procesari ce se aplica semnalului (video si audio); cu exemplificare si mai ales motivare</li> <li>- solutii de realizare a procesarii live (de ce live ?) a semnalului (aparatura specializata, soft specializat !!!??? - avantaje, dezavantaje)</li> <li>- ALGORITMI</li> </ul>
11	P11	Sisteme VRML	<ul style="list-style-type: none"> <li>- Scene graph</li> <li>- node semantics</li> <li>- events</li> <li>- time</li> <li>- scripting</li> <li>- navigation</li> <li>- lighting</li> <li>- toate cele amintite trebuie prezentate impreuna cu suportul tehnic / matematic, exemple</li> </ul>
12	P12	Jocuri electronice. Motoare grafice . Interfete software	<ul style="list-style-type: none"> <li>- Open GL 2.x, 3.x</li> <li>- DirectX 9, 10, 11</li> <li>- reprezentare obiecte grafice, suport matematic</li> <li>- integrarea in hardware</li> </ul>
13	P13	Jocuri electronice. Motoare grafice	<ul style="list-style-type: none"> <li>- Unreal Engine, Gamebryo, CryEngine, id Tech</li> <li>- specificatii</li> <li>- performante</li> <li>- middleware folosit</li> <li>- reprezentare obiecte grafice</li> <li>- middleware</li> </ul>
14	P14	Jocuri electronice. Motoare grafice. Suport Hardware	<ul style="list-style-type: none"> <li>- Pixel Shader 2.x, 3.x, 4.x, 5.x</li> <li>- Vertex Shader</li> <li>- integrarea in hardware</li> <li>- placi video</li> </ul>
15	P15	Jocuri electronice. A.I.	<ul style="list-style-type: none"> <li>- rubberband A.I.</li> <li>- Euphoria</li> <li>- pathfinding</li> <li>- dynamic game difficulty balancing</li> </ul>
16	P16	Jocuri electronice. Motoare de fizica	<ul style="list-style-type: none"> <li>- Havok</li> <li>- PhysX</li> <li>- Digital Molecular Matter</li> <li>- Performante</li> </ul>
17	P17	Procesare multimedia pe mobile	<ul style="list-style-type: none"> <li>- Mobile Multimedia Processors</li> <li>- Snapdragon</li> <li>- Kal-EI</li> <li>- Accessibility and learning</li> <li>- Server Assisted Adaptation and Networking Application</li> <li>- Face and speech recognition</li> </ul>
18	P18	Interactiune in sisteme multimedia. Principii	<ul style="list-style-type: none"> <li>- Interaction design</li> <li>- Function and form</li> <li>- Integrate media elements into the entire interface, not just the content</li> </ul>
19	P19	Interactiune in sisteme multimedia. Echipamente	<ul style="list-style-type: none"> <li>- Intelligent User Interfaces</li> <li>- Wii</li> <li>- Kinect</li> </ul>

### Special projects

1	S01	Tur virtual DSPLabs	- se discuta individual cu cei interesati si cu experienta in domeniu
2	S02	DSPLabs Business Package	- templates: document, business cards, reports, letters. power point presentations. envelope. email signatures. stationery