Ementa: *"Programming in NCL"*

Duration: 40 horas

The course is divided in 10 parts of approximately 4 hours. The first part (4 hours) is theoretical. The other ones are practical, in which students design NCL application examples step by step, exploring all language resources, gradually.

Course Description:

Part 1: Digital TV Overview — Application examples; DTV reference model (terrestrial DTV, IPTV, Broadband TV, etc.); Application requirements; Middleware; Ginga; NCL language and its scripting language (Lua); Authoring tools; NCL next generation.

Part 2: Authoring NCL applications — XML basic concepts; Introduction to NCL Eclipse authoring tool; NCL basic concepts: media objects (<media> element), media content sources; <area> elements, <property> elements, plane superposition (ZIndex); <port> elements, relations (<causalConnector> elements) and relationships (<link> elements); Application example with relation reuse (Example 1); Introduction to Ginga-NCL players.

Part 3: Authoring NCL applications — Region and property reuse: <region> and <descriptor> elements; Connector base importing; Interaction concept in NCL; Document structuring (<context> elements) and encapsulation (<port> elements); Relationship inheritance; Media object reuse; Application examples (Examples 2 to 5).

Part 4: Authoring NCL applications — HTML declarative object; Control management of key inputs; media object alternatives: <switch> elements, rule bases, etc.; Introduction to "Settings" node and to global variables; Configuration of environment variables in NCL players; Application examples (Example 6 and 7).

Part 5: Introduction to NCL Composer authoring tool; NCL composer configuration; The tool's views; Design of an NCL application (a structured application with intermedia synchronization, interactivity, embedded HTML object, etc.), using NCL Composer (Example 2 →6).

Part 6: Authoring NCL applications — Development of Example 7 using NCL Composer; Media-object's property handling; Transition effects; Animation effects; NCL application examples (Examples 8 and 9).

Part 7: Authoring NCL applications — Use of properties in relationship conditions (Example 10). Navigation control by using keys; Focus handling; Control management of key inputs revisited; Application example: Example 11.

Part 8: Interlaced media content in ES streams; NCLua imperative objects; NCL application example with embedded NCLua objects: Example 12.

Part 9: Authoring NCL applications —NCL document importing; Context reuse (Examples 13 and 14); Media objects with declarative NCL code; Application example (Example 15).

Part 10: Authoring NCL applications —Multiple exhibition device concept in NCL; Device classes and class registering; Hierarchical control model of secondary devices; Application examples using devices in passive classes (Examples 16 to 18); Application examples using devices in active classes (Examples 19 and 20). Generation of TS streams with embedded NCL applications.