La maison du dragon

La maison du dragon is a multifunctional, omni potential, integrative and participatory project. It combines all forms of art (craft, technology, performance, organization) realized as a mobile electronic puppet theatre, as a meeting place for all forms of creative activity, as a platform for both visual and performing arts. It enriches the training and further education of all trades involved in theatre projects as a tool case and as a real place of performance using emerging technologies.

> "All the world's a stage, and all the men and women merely players."
> — William Shakespeare, As You Like It

It strikes the bow from digitally based conception and preparation (script, audio, video, programming) to performance (control of light, sound, performance) to the participatory intervention of the audience (monitoring, choice, co-performance). The standardization and license-free distribution of all plans, building instructions, programming codes and documentation enables the release of creative ideas that are not even foreseeable at this point in time.

The choice of the small format (mobile puppet theatre from an easily transportable box) and the technical design (micro-computer, modular design based on standardized components, own power supply) offers the opportunity to perform even in remote locations. The modular structure also allows it to be quickly converted for different performances.

Project description:

1. goal

The aim is to develop a mobile puppet theatre using modern technologies. Classic trades such as stage painting, scenery and doll building are combined with front and back end design and programming. The platform will also explore participative strategies of interaction with the audience. In designing, preparing and realising theatre plays it will provide a social space for creatives to team up and cross over. The modular design enables other creatives to join the project. Based on open source and a creative common licence all sources will be given for free to authors, actors and performers.

The main goal is to bring together modern technologies and classic theatrical craft and to inherit how emerging technology can change, expand and replace existing forms of representation.

The dialogue between actors from different disciplines will enrich the individual's craft and create new impulses for the cultural power of the visual and performing arts.
The puppet theatre offers a mobile, easy-to-implement form of educational participation in the transition from art to education and reverse.

The platform can also be used for the training and further education of lace-makers and decorators, theatre machinists and stage technicians, theatre carpenter or theatre fitter or prop master.

Basically, it's about the pleasure of combining contemporary technology with contemporary art and creating a space for social togetherness.

2. Implementation

The heart of the design will be based on the Raspberry Pi unit and open Linux Operating System (OS). This micro computer will host a set of databases and scripts to enables the author of a theatre play to define a timeline for all involved components like audio, video, puppet movements, scenery movements and to run the performance in an automated way.

On one end the author can define for example a sequence for a spot light in a time line like light on – light off . On the other end these spot light can be placed before in a standardised upper stage as part of the complete design of the theatre scenery.

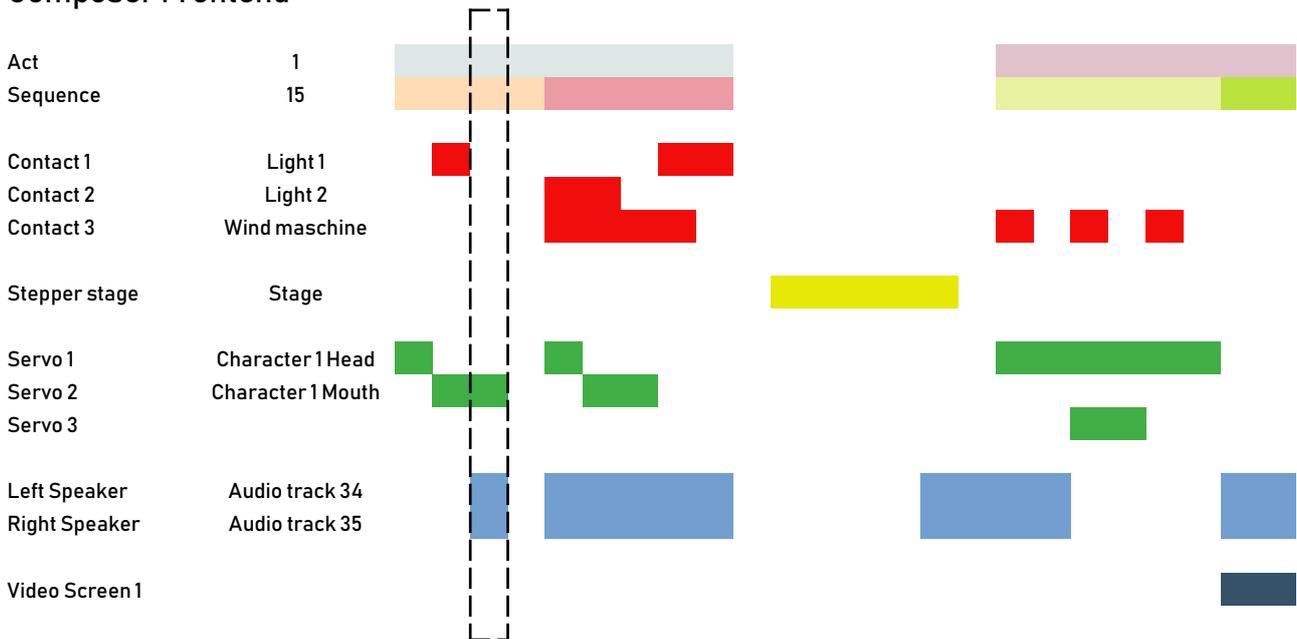|		
Puppet Scenery Audio Video Light Effects		Smartphone Remote Control Voice Movement
Database Server File server Web server Script	Theatre Play Act Sequence Logic	Composer Frontend

The Raspberry Pi itself provides a Linux OS and therefore a software platform for file and data base services. It also provides GPIO – ports to control external servos (to animate puppets or move scenery items), lights, sound and video sequences.

The composer frontend can be hosted on any web server (like Apache) and publicly available. It will create a dataset based on a given configuration of the physical design of the scenery. The dataset will be a container for all information to control and to perform a theatre play. As a subset it will provide all information for an act, its sequences and all logic (implemented possible interaction (audience) and alternative sequences).

One dataset can be uploaded and stored on the Raspberry Pi platform. It will control all puppet and scenery item moves, all audio and video, lights and other effects.

The Raspberry Pi platform enables the system to monitor the audience. If so implemented in the logic of the theatre play the audience can participate in the performance. For example could be a vote requested as part of the theatre play. Based on the vote one alternative sequence could be activated or music could be substituted by another.

Composer Frontend

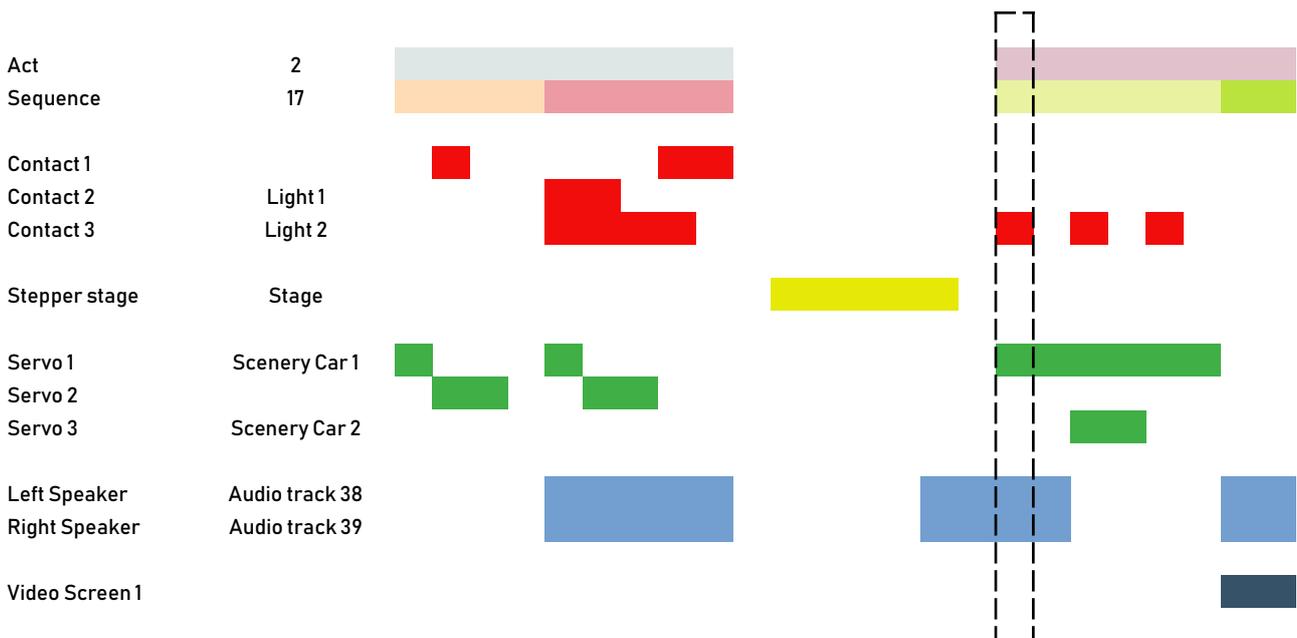|							
Act	1						
Sequence	15						
Contact 1	Light 1						
Contact 2	Light 2						
Contact 3	Wind maschine						
Stepper stage	Stage						
Servo 1	Character 1 Head						
Servo 2	Character 1 Mouth						
Servo 3							
Left Speaker	Audio track 34						
Right Speaker	Audio track 35						
Video Screen 1							

This schematic view on the front end describes the definition and visualisation of the dataset for one theatre play.
In the first column there is a list of all physical items on stage, which are available for usage. These are stepper motors, servos, lights, speaker, video screen.
In the second column is a list of resources, connected to these physical items. Contact 3 is a +12v power line and in act 1 it is connected to a fan (used as a wind machine).
A coloured field represents an action. In case of Contact 1 it provides +12V if the field is red.
 The box with the dashed line represents the actual active part of the time line and moves to the right side.

Act	2						
Sequence	17						
Contact 1							
Contact 2	Light 1						
Contact 3	Light 2						
Stepper stage	Stage						
Servo 1	Scenery Car 1						
Servo 2							
Servo 3	Scenery Car 2						
Left Speaker	Audio track 38						
Right Speaker	Audio track 39						
Video Screen 1							

In the second sample the box with the dashed line is located at the right side (which defines act 2). The list of resources in column 2 is different now. This means for example that

contact3 controls in act 2 the light number 2. Audio track 38 is delivered by the left speaker, and audio track 39 is delivered by the right speaker.

In the gap between Act 1 and Act 2 there is a block of yellow coloured fields, representing the activation of a stepper motor to move the turntable inside the puppet theatre. This part of the stage contains an upper part (fly tower) to lift or lower different settings for acts and theatrical performances.

Also a front stage (in front of the turntable) can be used to place actors or settings. The backstage supports space for other machinery.

The lower stage provides space for power lines, strings, bars and other mechanics to animate puppets or backdrops.

The entire area of the turntable can be used without segmentation. It also allows a division into 2, 3 or 4 segments, for example one segment per act. The turntable is then moved between the acts by the stepper motor.

On the side outside of the turntable , servomotors and power contacts are permanently mounted. At the moment of rotation, these components are retracted. When the turntable has reached the new position, the servomotors touch the mounts and the power lines (for lights and motors that are installed on the turntable) make contact with the supply lines under the floor of the turntable.

Backdrops can be lowered from the stage tower onto the front stage area.

A grid on all floors results in standardized mounts for motors, mechanics and scenes.

3. Special challenges
Design decisions such as the dimensioning of the revolving stage, the dimensions of the opening of the stage to the auditorium, the size of the grid for the installation and attachment of mechanics and technology as well as the choice of materials for pulleys, gears, cables and control rods are major challenges.

It becomes clear from the beginning that these fundamental design decisions will be difficult to change as implementation progresses and will ultimately lead to compromises.

The following strategies in decision-making promise success when starting the implementation:

Less is more.
The less fixed room construction is independent of a single play, the more individual the room construction can be for the specific play.
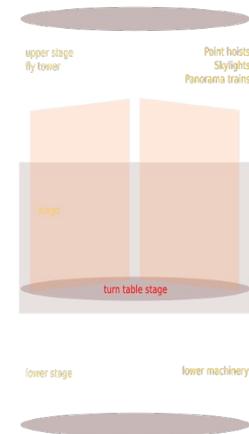
Wood before metal.
As far as possible, natural building materials should be used with respect for nature. This primarily includes wood as a renewable raw material (mechanisms, gears, gears, deflections).

Insert before screwing before gluing.
If components are manufactured with the laser cutter, clamping in a plug-in connection is preferable. A screw connection is only advisable for stressed connections and a final gluing is to be avoided whenever possible.

Standardization as a benchmark
Hard and software solutions that are already established as a quasi-standard are to be preferred whenever possible. In the hardware area, for example, these would be standardized roller bearings, metal bolts and screws, or servomotors, batteries, and cable guides. In the software area, solutions such as Linux OS, Apache web server, PHP and Python should be used.

Precise documentation of the wrong paths and compromises is advisable for a later redesign process and is continuously implemented in posts on the progress of the project.

4. Timeline
End of 2021 – research, prototyping of components
Beginning of 2022 – Mounting an alpha Version and testing of Hard- and Software
Spring 2022 – Creating a stable beta Version and stage preparation for a real theatre play
Early summer 2022 – Live performance for testing under real conditions
Summer 2022 – Participation in the EUFONIC 2022 festival (if selected)

5. Closing remarks
After creating social spaces in the virtual as well as in the real, I would like to turn to the theatre. The roots of my motif lie in my childhood, when I was allowed to watch backstage how the actors recited the words of my grandma, a German playwright and dialect poet in Cologne. They were words that I had known for months when I visited my grandma and watched her struggle to choose which words to use. The actors put these words into life, into reality. And I experienced the integrating power of these words, combined with body language, the basis of our culture.

May this platform serve my creatives to be able to inherit the same.

6. Links and contact details
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