STC#3 Report

Date: 30-31/03/2017
Place: Strasbourg (IHU)
Please find also enclosed the slides of the STC#3 presentation
(including workgroup presentations)

Participants

- Hugo Talbot (SOFA Consortium)
- Guillaume Paran (SOFA Consortium)
- Christian Duriez (Inria Lille)
- Jeremie Dequidt (Inria Lille)
- Bruno Carrez (Inria Lille)
- Eulalie Coevoet (Inria Lille)
- Damien Marchal (Inria Lille)
- Hervé Delingette (Inria Sophia-Antipolis)
- Thomas Lemaire (Inria Grenoble)
- Stéphane Cotin (Inria Nancy)
- Rémi Bessard Duparc (Inria Nancy)
- Maxime Mogé (Inria Nancy)
- Bruno Marques (Inria Nancy)
- Igor Peterlik (Inria Nancy)
- Fabian Aichele (TruPhysics)
- Matthieu Nesme (Anatoscope)
- Jérémie Allard (InSimo)
- François Jourdes (InSimo)
- Nicolas Gautier (InSimo)
- Erik Pernod (indie)

Consortium Report

Please report to the slides STC#3
Focus on: membership V2

First, the future membership V2 of the SOFA Consortium has been presented. No specific remark on the structure of the proposal. The marketplace should take more importance in the future (for Business Members).

Any feedback about the proposal, the pricing, new ideas are welcome.

Focus on: dev workflow

Then, the process of contribution was presented: GitHub workflow and voters (Technical Members) for merging major features.

Feedback:
- InSimo: tests which highlighting an issue are named with a suffix OpenIssue. Since these tests highlight a problem in the code, they fail.
  \[\rightarrow\] add flag ACTIVATE_OPENISSUE_TESTS (default: false)

- Damien Marchal: InSimo should share its continuous integration outputs to help and make sure that new PRs are not breaking compatibility

- InSimo: Not enough new features in SOFA to justify our update effort deconnexion between video and reality

- crashes were noticed when there is a contact creation or destruction

- loading of Python (management of paths)

- LCPForceFeedback (haptic) is apparently broken on master

Reference to OpenSim: keep an eye on it
Added reference by Matthieu: ArtiSynth using similar principles of SOFA (mappings) developed by a prof Sidney Fels
GitHub Projects

The "Project" feature on GitHub is now used to organized the workgroup discussion and management. Please have a look at https://github.com/sofa-framework/sofa/projects/

- Add review column in Projects → for pending PRs
  closing issue : define condition
  existing rules: not the committer that merge (read the CONTRIBUTING.md)

- Nice suggestion (InSimo) for BREAKING PRs
  ○ do a specific commit for the API change
  ○ and put the consequences in other commits
  ○ give the hash of the API change commit in the PR description
  ○ edit the Changelog.

- Move yourself from assignees if you want instead of ignoring the PR

SofaQtQuick

SofaQtQuick is now on GitLab
Feedback from Fred and Damien. Consortium is switching on it.

Should all consider this, since it will be proposed as runSofa2 for next STC
Contact: carre@anatoscope.com
Workgroup discussions

SofaPython (Bruno C.)

Since STC#2, Python3 was successfully integrated in SofaPython plugin. All work has been done in https://github.com/SofaDefrost/sofa/tree/SofaPython3
Next big step is to choose between 3 possibilities:
  1. Maintain SofaPython27 and SofaPython3 in parallel
  2. Freeze SofaPython27 and focus future dev on SofaPython3
  3. Drop SofaPython27 and keep only SofaPython3

Feedback:
  ● ROS and some OS are still using Python 27: we have to keep a legacy version.
  ● You can control the main loop of SOFA with Python

Leader: Bruno Carrez
Involved: François (IS), Anatoscope, Thomas, TruPhysics (Python27 maintenance)
Interested: Bruno M., Fred (create components)

Validation (Igor)

The work nicely progressed on this workgroup. But again, communication was missing to inform everyone within the community. Next steps and tasks has been defined in the associated Project. Funding will be found for this project.

  ● The elements type must be specified
  ● The comparison should focus on comparing stiffness matrices
  ● This will also allow to use and improve regression tests in SOFA
  ● Testing a component != testing a chain of components working together
  ● Defrost: Create a tool to know if a component is validated?

Mapping/Masks (Christian)

This workgroup did not progress at all. The Defrost team worked on a new process for handling sparse matrices in SOFA (through ForceFields and Mappings). This work renamed "SparseMatrices" was done by reusing a maximum number of existing components. A component MappedMatrixForceField was implemented based on the MechanicalAccumulateJacobian visitor.

The defrost team proposed to work on an unified way of dealing with sparse matrices. Proposed for the next STC.

About masks: example and tests should be provided highlighting any bug / issue.
Multithreading (Fabian)

Since the last STC#2, this workgroup did not progress significantly. This is mainly due to a lack of communication. The STC#3 showed very good motivations.

Feedback:
- InSimo had a bad experience of InSimo by merging the integration branch and trying to get closer from master (master branch + issofa_multithreading branch)
- the merge of InSimo features should involve code really using multithreading functionality
- needs of rock-solid multithreading (empiric tests)
- test c++11 implementation at InSimo
- Maxime Mogé starts a 2-year project for multithreading : focusing on a Node level, making visitors thread safe
- TruPhysics would like to focus on Collision detection

User Experience (Damien)

The first step consists in updating the doc/contributing. Several issues were raised:
- 2 mesh data structures co-exist
- naming of components (filename, elasticity parameters …)
- Focus on the code that make SOFA a physics engine in SOFA → reduce the scope of this problem and the rest is not the responsibility of the SOFA community

SOFA NG (Stéphane)

This workgroup is a wide topic. It is important to define it properly to ease the progress and management of it.

Feedback:
- InSimo: collision detection should not be considered, it's specific and maybe too wide if we talk about minimal SOFA
- InSimo: moving plugins to repos may break the contribution process. Refactoring and merging new feature should be done carefully to avoid breaking the contribution process (idea of table of correspondence for each refactoring via a script)
  → note that a Changelog is now updated at each release to help on such cases
- Compare with other simulations (see above OpenSim …) for important minimal functionalities
- Defrost: clean components != pertinent components
  Everyone might not agree on the selected components (use the union / intersection of components of interest)
- external users might not agree either
- Defrost: components could be tagged regarding their level of quality (tested, validated, example, code)
This workgroup will involve a lot of refactoring.

- who leader?
- who interested? Christian, Erik, Matthieu (once it is running)
- define accurately the future tasks

Data update (Matthieu)

This discussion is related to the issue #44 InitData must go! from Maxime Tournier

This initData can even affect performance, since for the moment, it requires very heavy access to MechanicalObject. getValue is heavy and not necessary in a lot of use cases. This might also be related to the multithreading WG which will start by focusing on this Data access.

→ create a "general discussion" issue?

SOFA & Unity (Erik)

SofaPhysicsAPI has been updated. Now able to create object in Unity with physics from SOFA. You can find the video on Youtube.

Erik explained that the visualization part is fully handled by Unity and can be run asynchronously.

For data access, this work requires to have an homogeneous way to access data, and homogeneous naming among components. This is related to the UX and Validation workgroup.

However, this is a separate initiative and won't be integration in another workgroup.
Vote

The first step of the meeting consisted in listing and discussing the existing workgroups and the new propositions. After the discussions, we set up the vote.

The STC vote highlights the 4 workgroups in which the consortium and its members will commit themselves for the next 6 months.
Following the STC, the consortium will follow with a very specific care the progress and developments made in the 4 selected workgroups.

We detailed the process of the vote for SOFA Workgroups. Each SOFA consortium member has one vote at the STC (as scheduled in the membership V2). Since Inria mainly funds the consortium and since a balance between academics and companies is sane for the open-source platform, the vote were given as follows:

- InSimo : 1 vote (Jérémie or François J.)
- Anatoscope : 1 vote (Matthieu)
- TruPhysics : 1 vote (Fabian)
- Inria : 3 votes (Christian, Stéphane, Hervé)

The vote was under some rules:

- for each proposal, 1 leader (any) is needed to be candidate for vote
- for each candidate, we vote
- realistic workgroup
  - clear objective
  - clear roadmap
  - common interest
- To be accepted, a workgroup must have a dedicated and active leader

Following the vote, 4 top workgroups were selected:

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Leader</th>
<th>Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>SofaPython</td>
<td>Bruno C.</td>
<td>2: Anatoscope, Inria_2</td>
</tr>
<tr>
<td>Validation</td>
<td>Igor</td>
<td>4: TruPhysics, Inria_1, Inria_2, Inria_3</td>
</tr>
<tr>
<td>Sparse Matrices</td>
<td>Christian</td>
<td>4: InSimo, Anatoscope, Inria_2, Inria_3</td>
</tr>
<tr>
<td>Multithreading</td>
<td>Fabian</td>
<td>3: InSimo, TruPhysics, Inria_1</td>
</tr>
<tr>
<td>User Experience</td>
<td>Damien</td>
<td>2: Inria_1, Inria_2</td>
</tr>
<tr>
<td>SOFA NG</td>
<td>Stéphane</td>
<td>3: Inria_1, Inria_2, Inria_3</td>
</tr>
<tr>
<td>Data update</td>
<td>- no volunteer -</td>
<td>- no volunteer -</td>
</tr>
<tr>
<td>SOFA + Unity</td>
<td>Erik</td>
<td>2: Anatoscope, Inria_1</td>
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