



SOFA

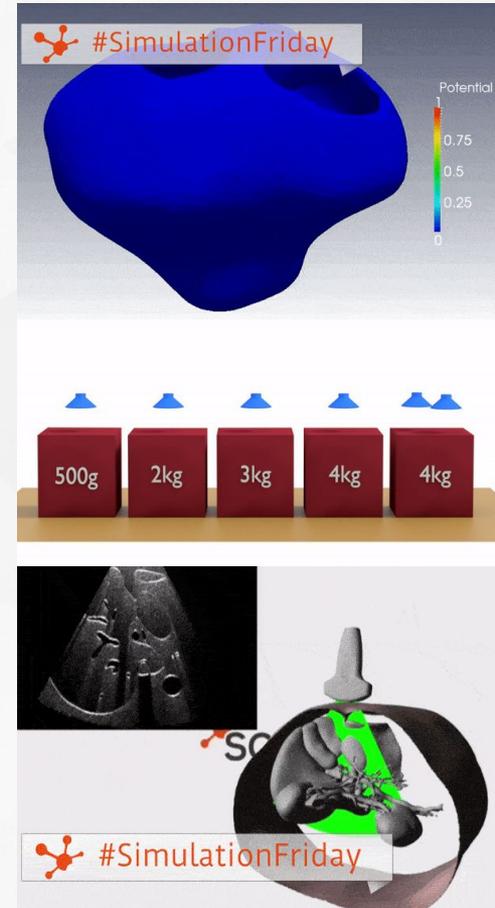
Simulation
Open
Framework
Architecture

An open-source solution for collaborations,
prototyping and innovation in simulation

Love Data Week 2023
20230228 - Strasbourg

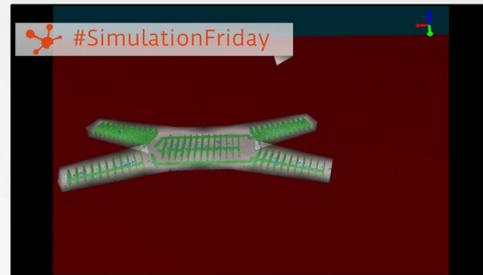
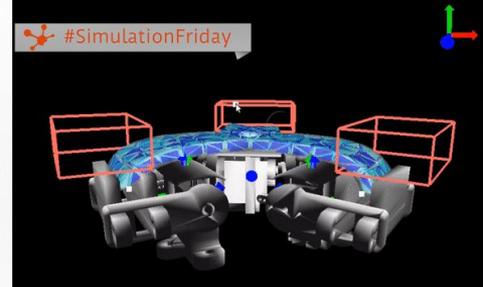
A framework for interactive physics simulation

- Implements mathematical models & algorithms
 - Soft and rigid body dynamics: biomechanics
 - Some other models: heat transfer, basic fluid mechanics
- Various fields being investigated
 - Medical simulation
 - Robotics and control → soft-robotics
 - Animation
 - Biology

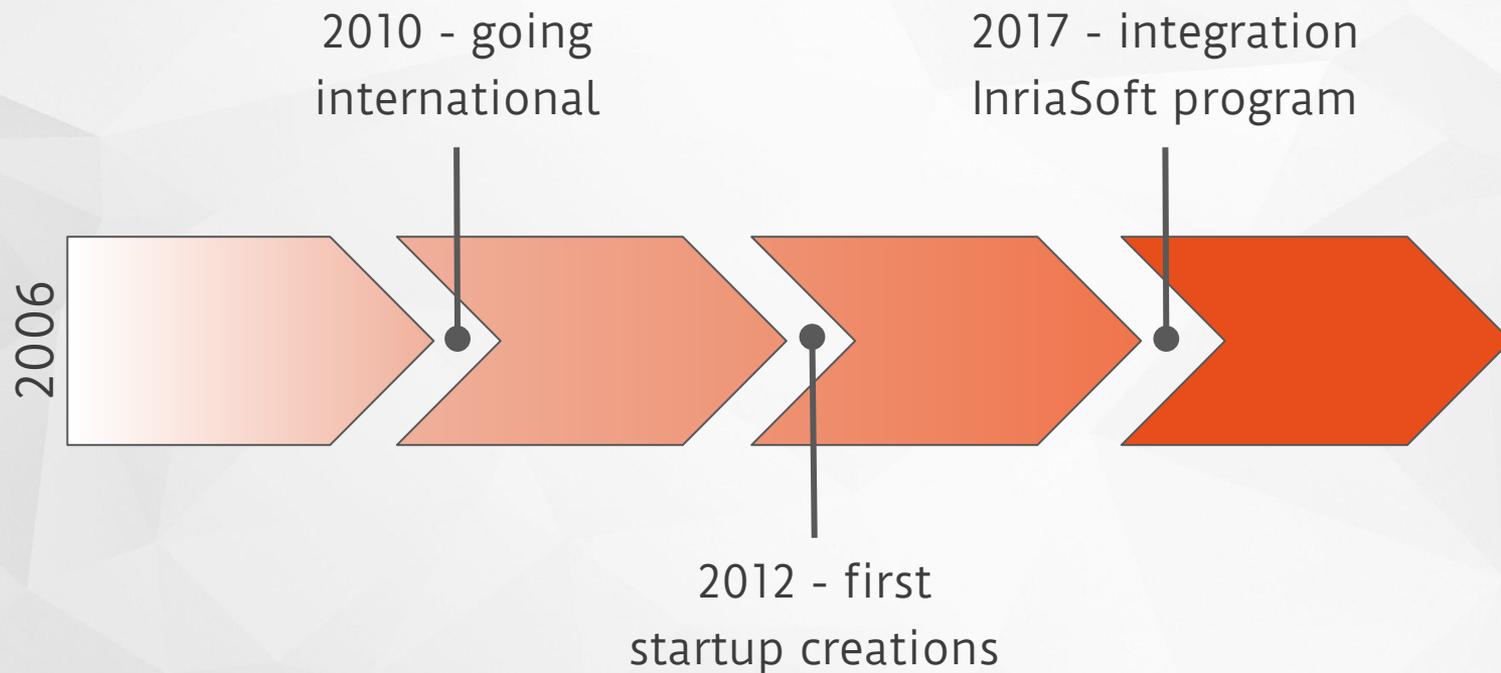


Software architecture

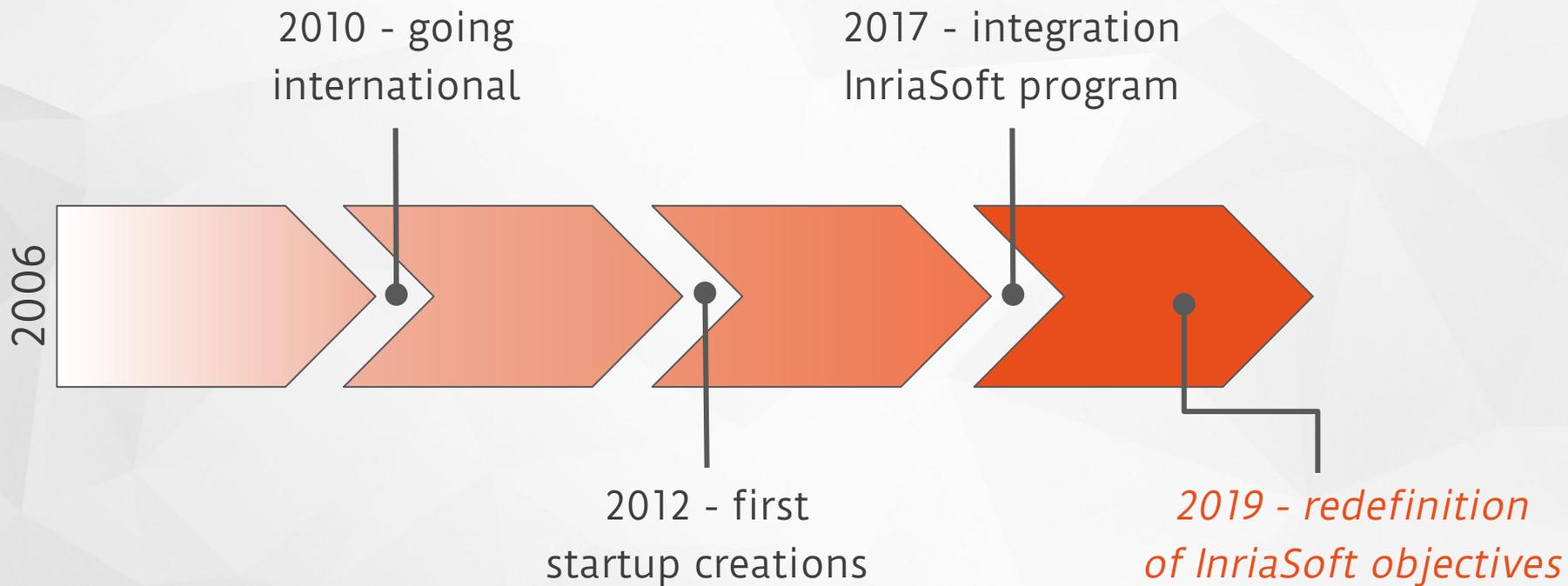
- Code structure: OpenCore
 - Stable core written in C++ under LGPL v2.1
 - Coming with Python bindings
 - Development of plugins (free-to-define licence)
- Multi-platform   
- Documentation
 - Open forum → GitHub discussions
 - User online documentation → sofa-framework.org/community/doc
 - API documentation → sofa-framework.org/api



Project history



Project history



An international community

- Developed from more than 17 years
- +1000 worldwide users
- +150 daily developers
- Today
 - Worldwide universities 80%
 - New international startups 10%
 - International companies 8%
 - Independent developers 2%



An international community

- Grew through international collaborations and projects
- 7 startups created for the last decade
- Technology transfers
- Growing activity



Code production

- Relying on Git versioning system
- Hosted on GitHub → github.com/sofa-framework/sofa
- Contributing
 - Proposing the feature through GitHub pull-requests
 - Peer-review process (weekly) → stable development process
 - Stable release
- Roadmap definition at Technical Committee



Code production

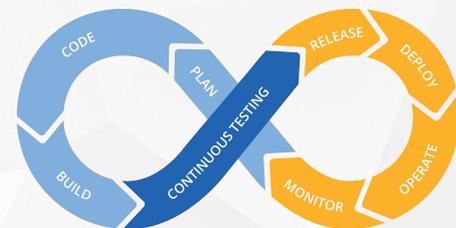
- Relying on Git versioning system
- Hosted on GitHub → github.com/sofa-framework/sofa

- Releases
 - Stable release 1 every 6 months
 - Contributions 350 pull-requests each
- Downloads of binary versions 480 / month
- Unique cloners 240 / month
- Forum posts 150 / month



An open-source consortium: missions

- Gathers partners willing to share the costs of
 - Maintenance and industrialization
 - Coordination of the developments
 - Animation and support to the community
 - Growth of the ecosystem: open-source community and business
- Acting as a third-party and non-profit organization
- Hosted at *Inria*



An open-source consortium: partners

- Strategic partners, steering the strategy of the project

Inria

- Technical members, defining the roadmap based on contributions



- Donors



An open-source consortium: objectives

- Gather industrial and academic partners sharing engineering costs
 - Consortium members
 - Donors
- Make the community grow, foster collaboration and innovation
- Foster contributions
 - Code contributions
 - Other : documentation, forum support, citations
 - Taking part in community events

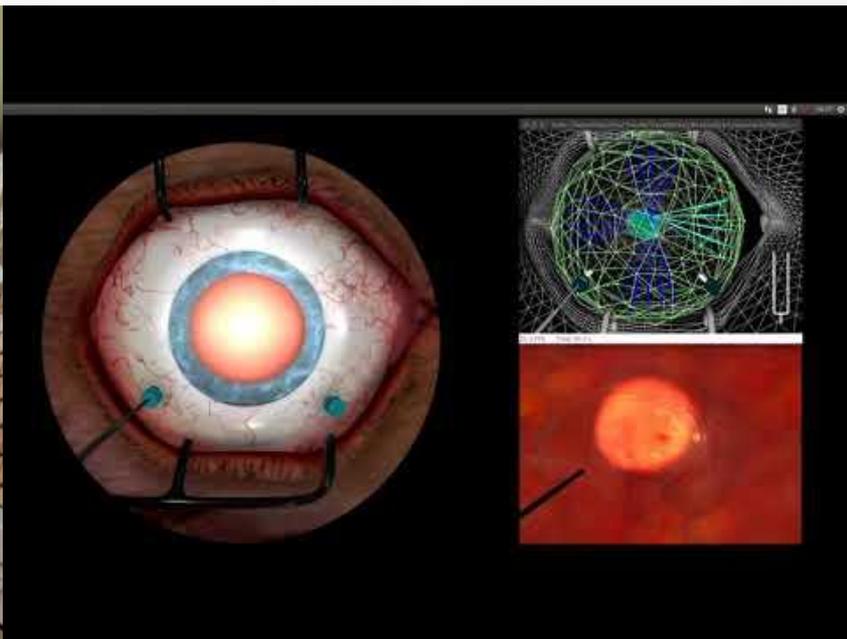
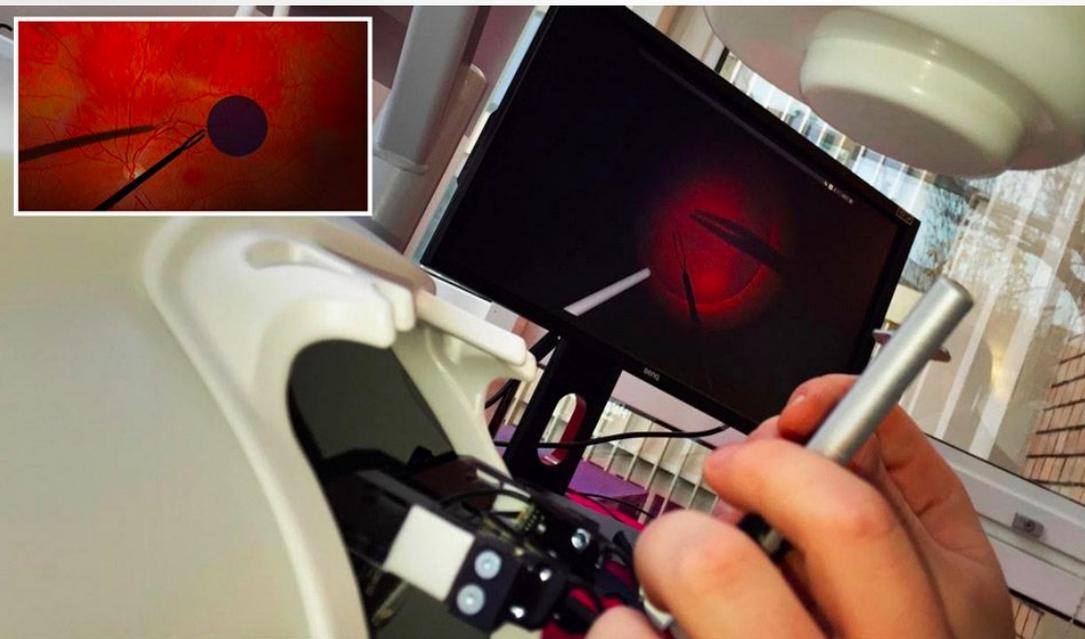


Any questions?



www.sofa-framework.org

Any questions?



Inria



www.sofa-framework.org

