

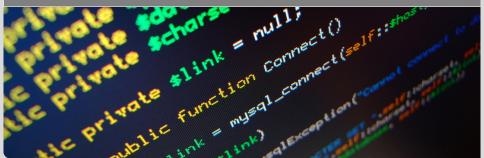


### rootJS - results of the implementation phase

Software Engineering Practice - Winter Term 2015/16

C. Wolff, M. Früh, S. Rajgopal, C. Haas, J. Schwabe, T. Beffart | February 13, 2016

#### STEINBUCH CENTER FOR COMPUTING



《日》《圖》《意》《意》

## **Outline**



Fullfilled criteria

- Changes in design
- Statistics



#### The bindings must

- Work on Linux
- Allow the user to interact with any ROOT class from the Node.js JavaScript interpreter
- Accept C++ code for just-in-time compilation
- Update dynamically following changes to C++ internals
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access)



#### The bindings must

- Work on Linux ✓
- Allow the user to interact with any ROOT class from the Node.js JavaScript interpreter
- Accept C++ code for just-in-time compilation
- Update dynamically following changes to C++ internals
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access)



#### The bindings must

- Work on Linux ✓
- Allow the user to interact with any ROOT class from the Node.js JavaScript interpreter ✓
- Accept C++ code for just-in-time compilation
- Update dynamically following changes to C++ internals
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access)



#### The bindings must

- Work on Linux ✓
- Allow the user to interact with any ROOT class from the Node.js
  JavaScript interpreter
- Accept C++ code for just-in-time compilation ✓
- Update dynamically following changes to C++ internals
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access)



#### The bindings must

- Work on Linux ✓
- Allow the user to interact with any ROOT class from the Node.js JavaScript interpreter ✓
- Accept C++ code for just-in-time compilation ✓
- Update dynamically following changes to C++ internals ✓
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access)



#### The bindings must

- Work on Linux ✓
- Allow the user to interact with any ROOT class from the Node.js JavaScript interpreter ✓
- Accept C++ code for just-in-time compilation ✓
- Update dynamically following changes to C++ internals ✓
- Provide asynchronous wrappers for common I/O operations (i.e. file and tree access) ✓

## Movieframe



## mpv frame



test

# **Limiting Criteria**



#### The bindings should not

- Add any extending functionality to the existing ROOT framework
- Necessarily support previous/future ROOT versions



# **Limiting Criteria**



#### The bindings should not

- Add any extending functionality to the existing ROOT framework
- Necessarily support previous/future ROOT versions



# **Limiting Criteria**



#### The bindings should not

- Add any extending functionality to the existing ROOT framework
- Necessarily support previous/future ROOT versions ✓



# **AsyncRunner**



- We added a helper class for asynchronous operations, 'AsyncRunner'
- Uses libuv internally
- TThread doesn't allow communication between node threads

### MetaInfo



- We added a helper class to encapsulate differences between TGlobals and TDataMember
- TGlobal inherits from , TDataMember from

C. Wolff, M. Früh, S. Rajgopal, C. Haas, J. Schwabe, T. Beffart - rootJS - implementation

# Other functionality



- Dynamic library loader: ROOT doesn't load enough libraries on its own
- removed get exports



### **Statistics**



- 4500+ LOC
- 300+ commits