

# Final Presentation of CAS/CSE741

Document Polishment, Source Code, Unit VnV, etc.

Bo Cao

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# Thanks!

Thank you all for your advice!

# Possible directions

- ▶ Change SRS to CA.
- ▶ Elaborate on some points.
- ▶ Remove MATLAB pseudo-oracle: Small size test cases, manual computation of oracle.

# Source Code: Overview

Implementing language: C++

- ▶ Low-level enough.
- ▶ Complex grammar and/or supporting libraries.
- ▶ Template support.

Future developments: C API

- ▶ Some people still use C.
- ▶ Compatibility.
- ▶ Easy to build C API based on C++ code.

# Organize

Templated class/function.

- ▶ Source code distribution
- ▶ Header file

# License

## MIT License

- ▶ Low-level library, source code distribution.
- ▶ High possibility of commercial usage.
- ▶ Public, basic knowledge, no potential of revenue.

Made public for everyone.

# Structure Overview

Tree structure from the root header.

**Leaf** Implement code (data structure/function).

**Non-leaf** Include leaf headers.

All data structure/function in namespace CFS

# Headers

Library all-inclusive header CFS.hpp

Data CFSDData.hpp

Modules CFSSModuleName.hpp

Function Function.hpp



# Function header template

```
#ifndef FSL_FUNC_H
#define FSL_FUNC_H

#include "CFSDData.hpp"

/* Other library inclusion is here*/
namespace CFS{
template<class FLOAT>
/*RETURN TYPE*/ FUNC(/*PARAMETER LIST*/)
{
    /*FUNCTION BODY*/
}
}
#endif
```

# Tool Introduction

- ▶ Unit Test: Catch2, single header tool
- ▶ Code Coverage: gcc+gcov

# Unit Test structure

Controller

TestCase groups

- ▶ Test Cases
  - ▶ Initialize Data
  - ▶ Function Call
  - ▶ Assertion

# Test Case Derivation: Data structure and setter/getter

- ▶ Setter/getter pairs: call setter, call getter, compare getter result with setter input.
- ▶ Exception: Pass data with expected exceptions, check whether expected exception thrown.
- ▶ Pairs with index:
  - ▶ OOR(Out-of-range) exception check: call setter/getter with index overflow/underflow, check exception thrown.
  - ▶ Setter/getter independence: call getter with index  $M$ , call setter with index  $N (M \neq N)$ , call getter with index  $M$ , check whether getter result changed.

# Test Case Derivation: Functions

- ▶ Check `ToleratedEquality` and dependency first, used for comparison later.
- ▶ Check other function. If function A relies on function B, Check B before A.
- ▶ For each function:
  - ▶ Check result, if `FLOAT/CSFT` type, report error and whether it is within the pre-set tolerance.
  - ▶ Check exceptions thrown if given input with expected exceptions.