

Hi ~

- NTU 4 yrs

Chemical Eng  
↓  
Nuclear Eng

\* Chemical E

1. mass / E bal

2. Mat Sci

3. Labs

Nuc E

- Screening  
exams

- TH

4. Bio Molecular Eng

$\text{n}^{4C}$   
- materials

- neutronics  
- physics

5. Thermo

6. Eng Math ODEs

7. Org chem

sim

8. Fluid mech

9. Comp methods\*

10. Chem Thermodynamics

molar  
salt  
research

11. Heat & mass trF

12. unit ops - distill

13. Chem rxn eng - CSTR  
PFR

14. Process Control - PID

15. Solid Fluid - Fluid Bed

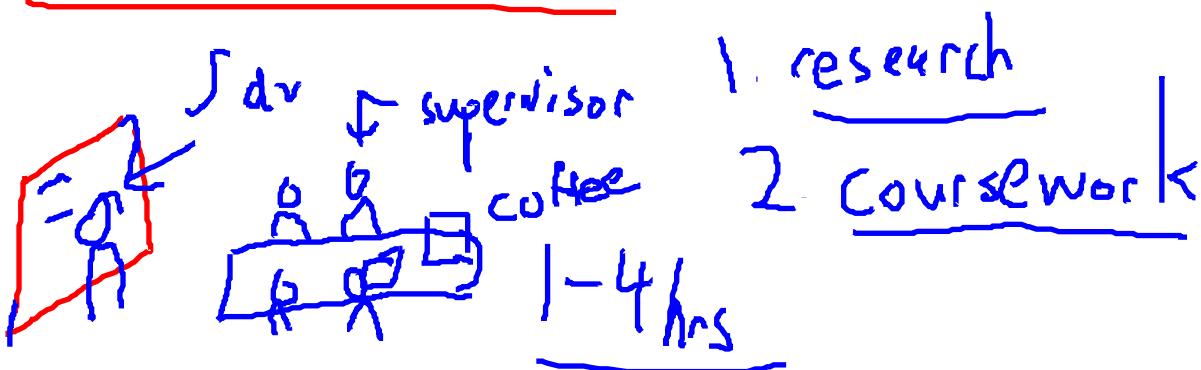
Pebble  
Bed

16. Safety - HAZOP

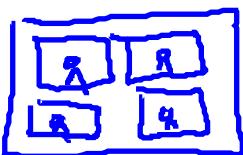
17. Internship ✓
18. Petroleum Refining ✗
19. FYDP ✗

↓  
Risk

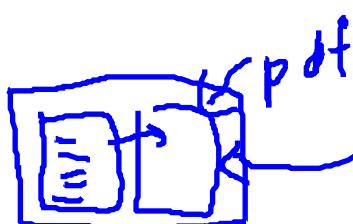
## Qualifying Exam



## COVID



## ZOOM



next pt 2  
- Multigroup diffusion  
    n  
- energy eff

- feedback mechanism

fuel temperature

## Research plan

120 slides

When I started...

① try to sim reactors PDE

② learn as much as possible

↳ sim techniques

}

③ expt + sim SD/SB

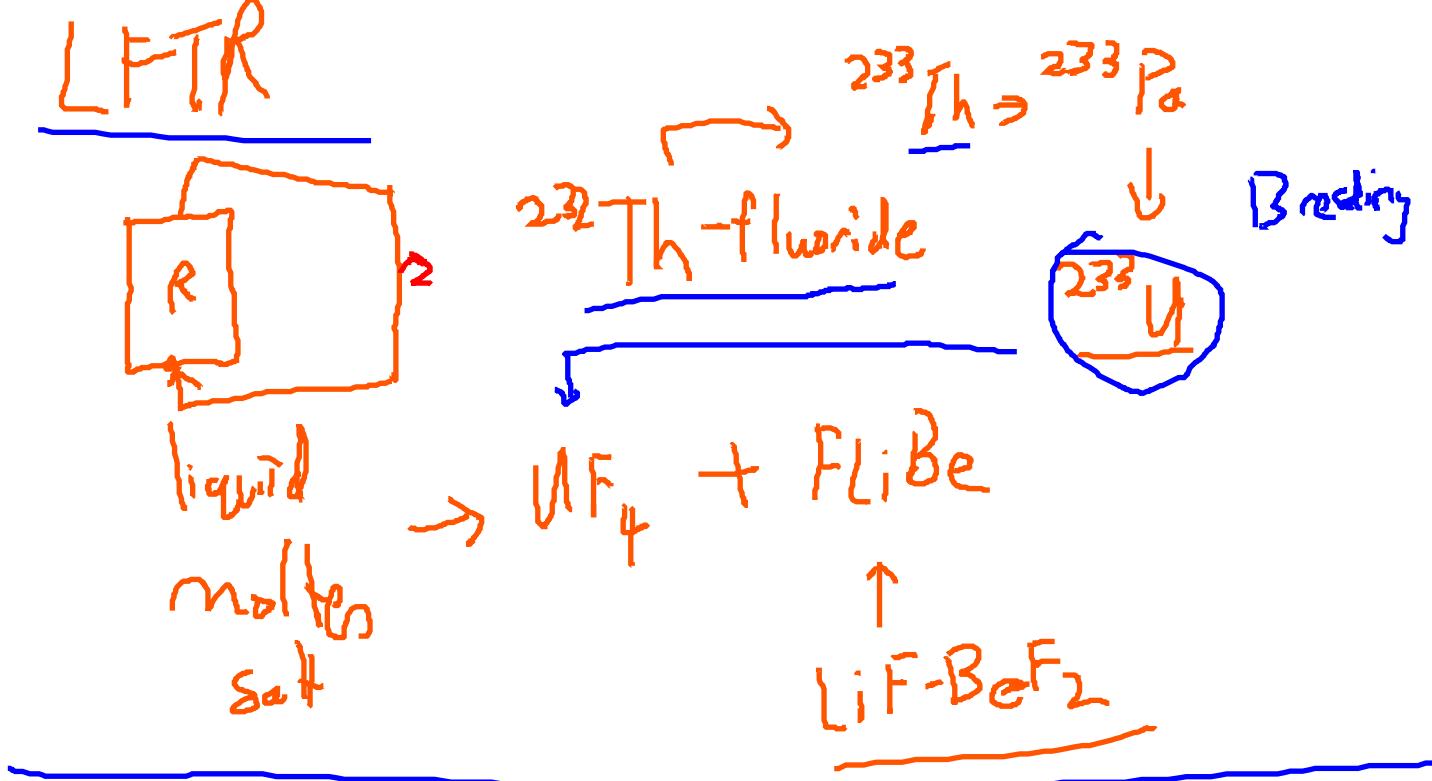
④ MSR → FHR →

CET

Prof  
Paterson

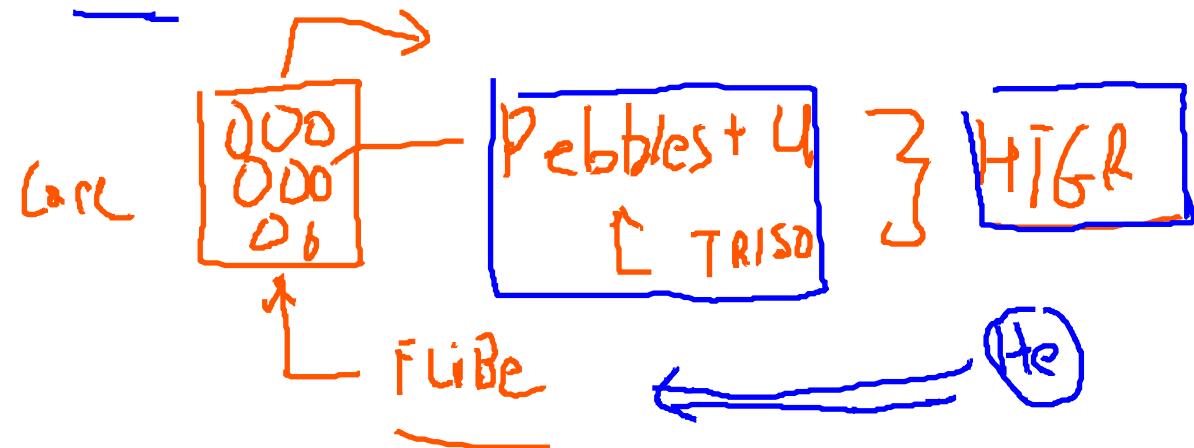
scale model

## LFR

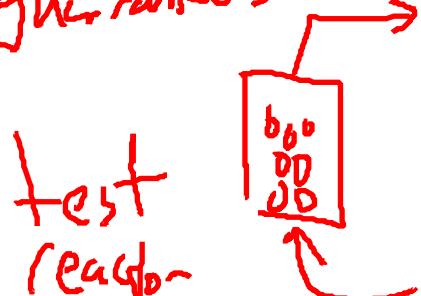


## FHR - Solid fuel

2011?

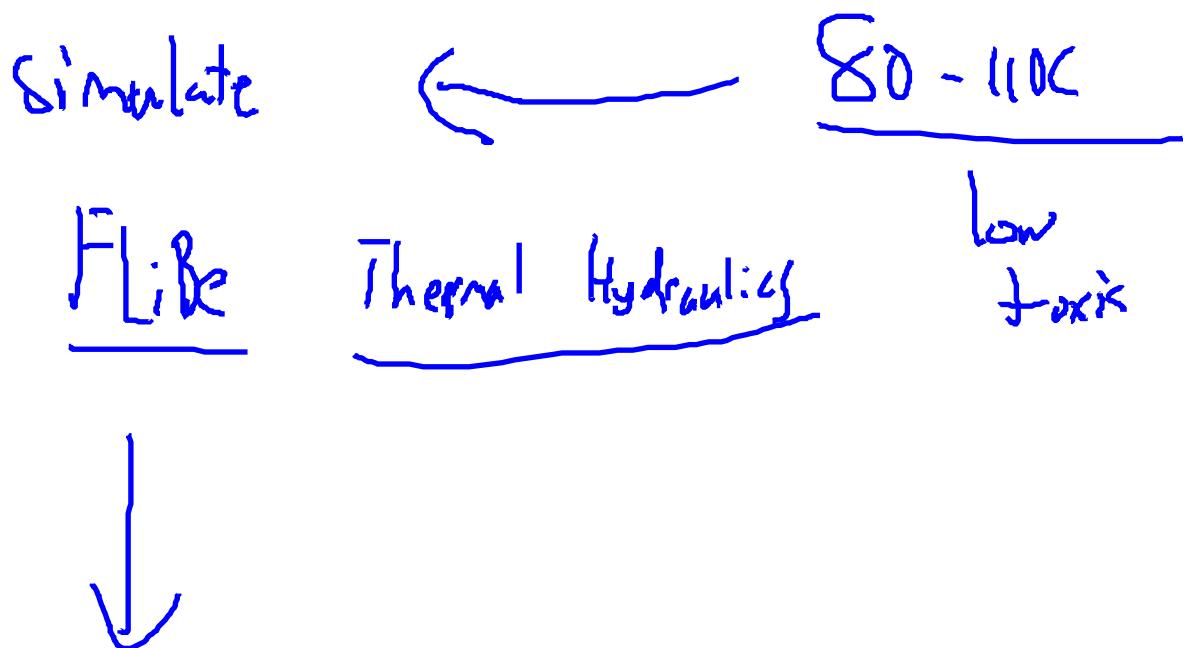
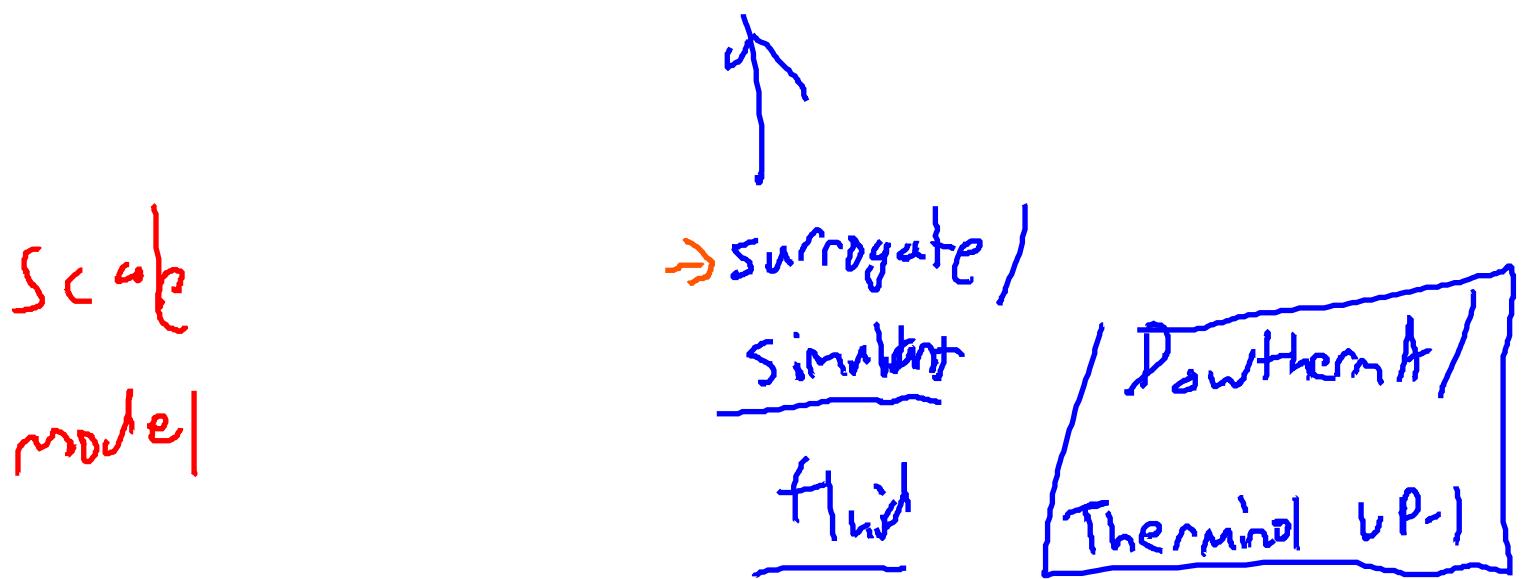
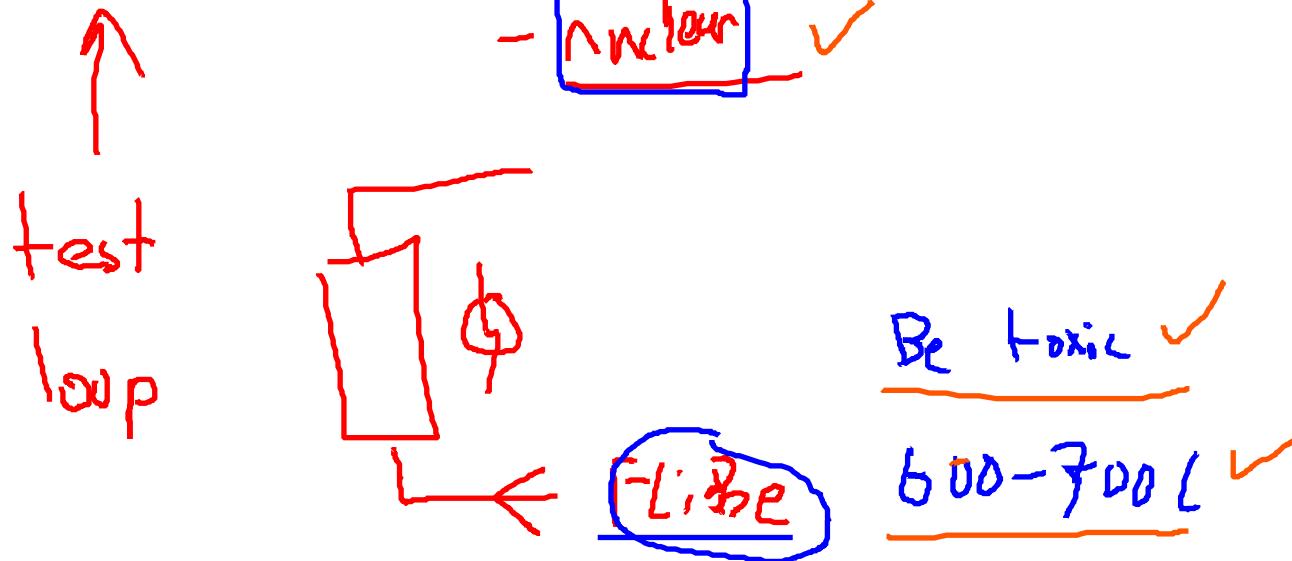


Safety guarantees



-Safety

-operational (molten salt) ✓



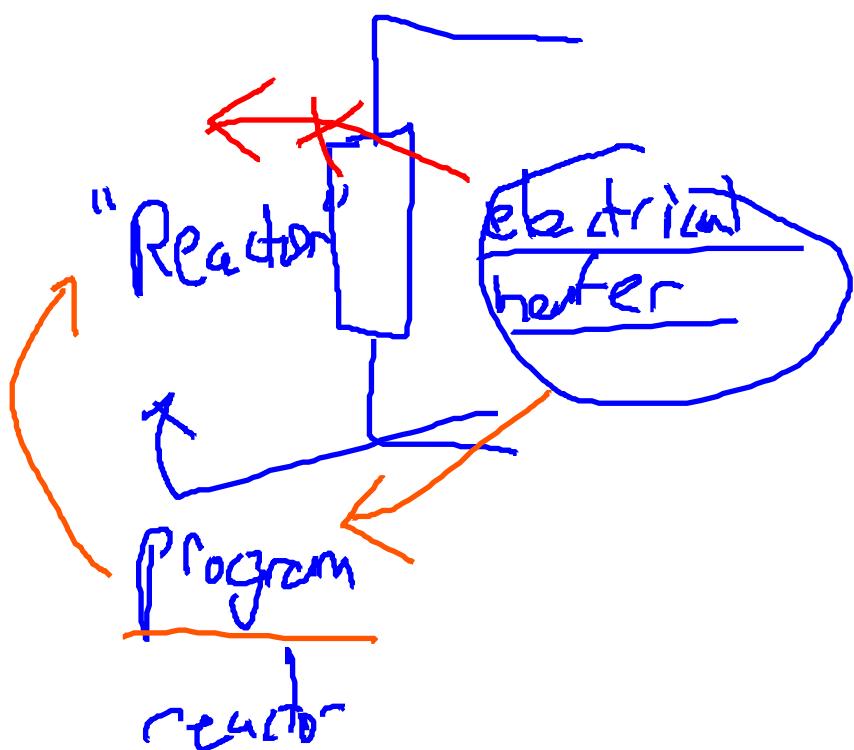
Compact

Integral

CIEF

Effects

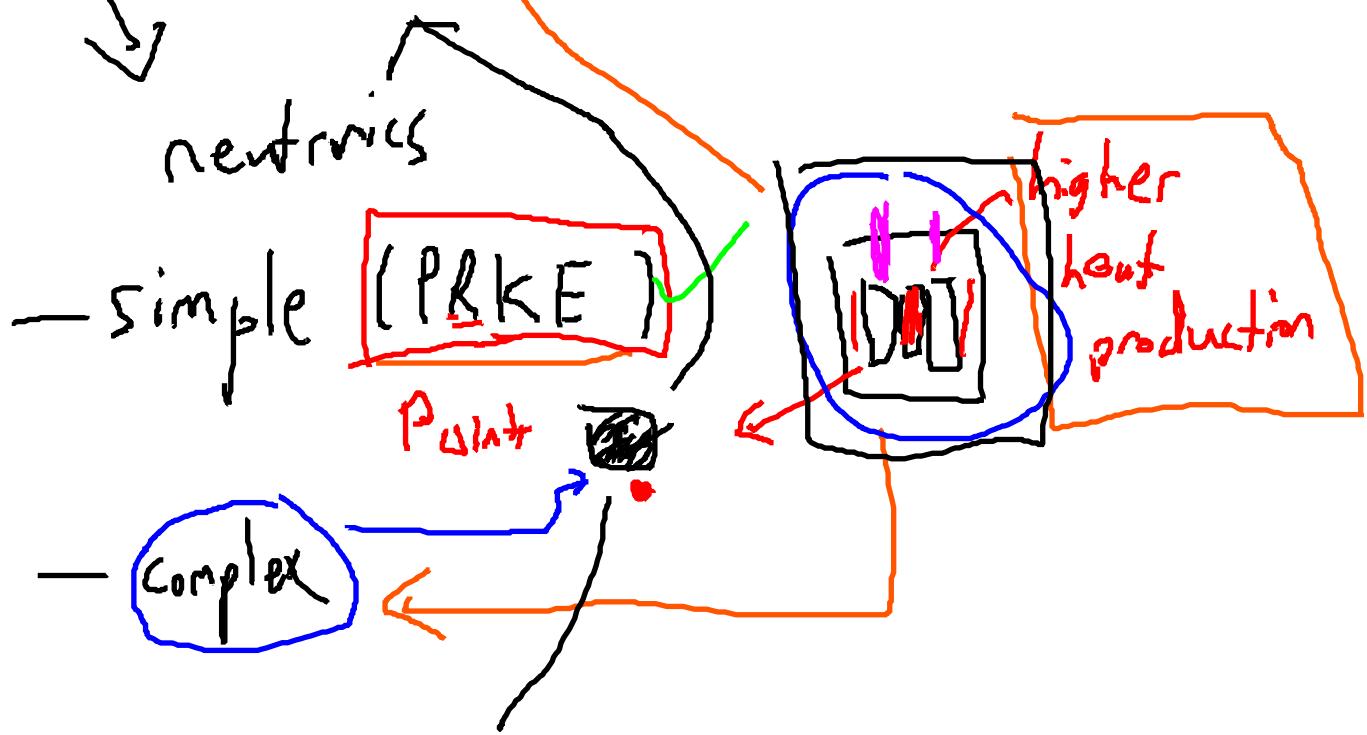
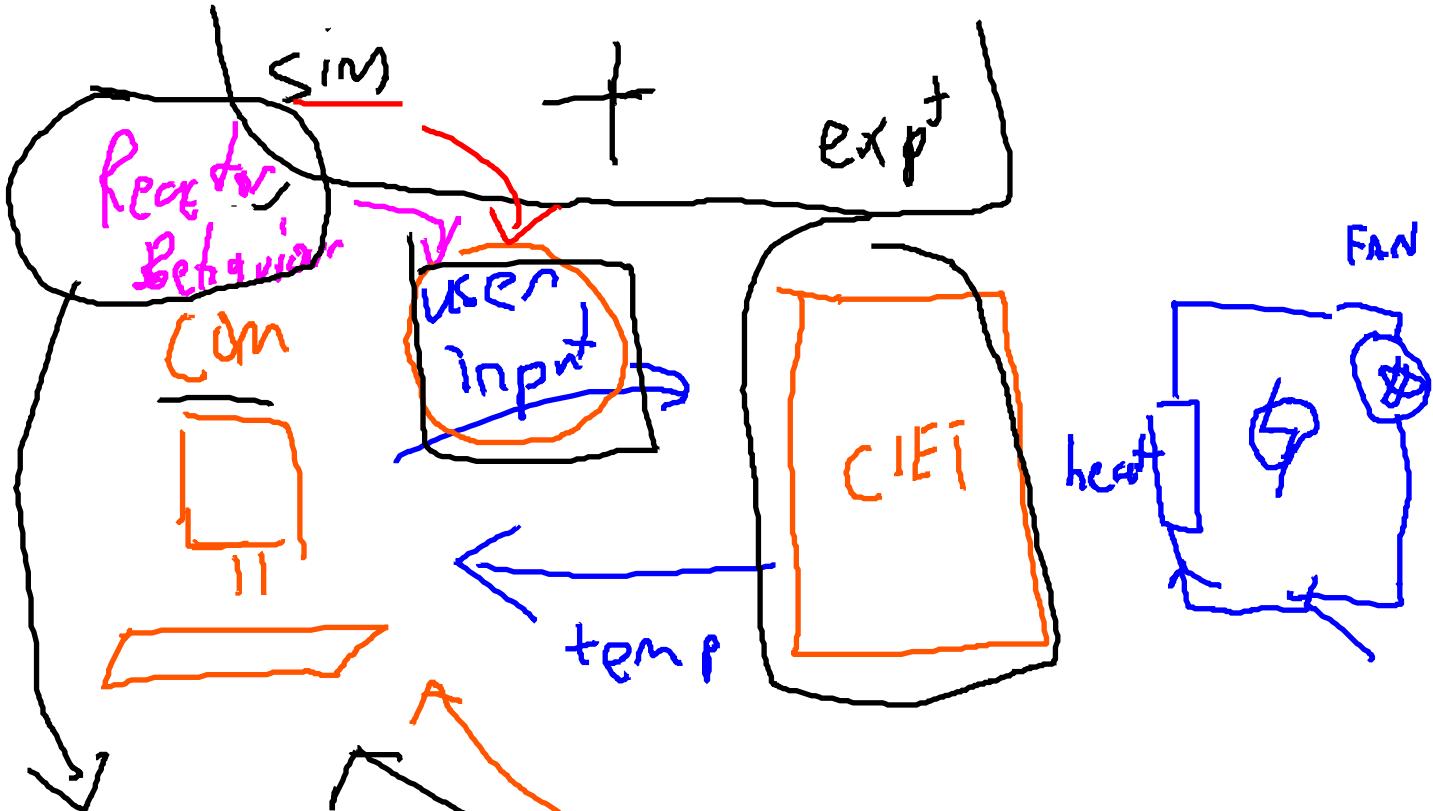
Test



behaviour

SNF

feed back



data based Surrogate model AI

y axis  
| Complex Model (multi-physics)

OpenFOAM → GCFour

High F:

OpenMC

## 2. Surrogate model

- labview

- data based modelling

3.

~~Operate CIET~~

year 1 → 2

→ ~~bags~~

Covid → ~~L&A~~

Real time sim of CIET

- 10 successful runs  
of CLET

- ~~2-3 times~~, bug

10 weeks      1/week

~~50 weeks~~

~~50 weeks~~      3 years

Covid  
2021 - 2022 (?)

↳ real time sim of CIE1

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