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PhD from start to finish (almost)

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Overview

- Projects/research
  - What needs to be done?
  - What needs to be learned?
- Courses
  - Help with projects, research and perhaps teaching?
- Papers
  - Condense projects/research and publish
- Teaching
  - Pass on knowledge to new students

Projects

- PRISME 1 & 2
  - Fire safety in nuclear power plants
  - Electrical fires
  - Pool fires
  - Mechanical ventilation

- NKS Poolfires
  - Learn more about pool fires
  - Pool fire experiments
  - Modeling of pool fires

Projects

- Key issues in both projects:

  - Modeling of pool fires
    - Radiative feedback
    - Oxygen depletion

  - Mechanical ventilation

What needs to be done?

- Mechanical ventilation
  - Brand new existing model in FDS, must be validated
- Pool fire model
  - Existing ones did not fit needs, implement new one in FDS (Fire Dynamics Simulator)
- Model interaction between fire and building – general problem

Courses – what is needed?

- Pool fire model
  - Implementation in FDS means programming, need to learn programming!
  - Initially learned Java, Matlab and some Fortran
- This is fun, what else?

More programming

- Virtual Reality is on the rise – use in fire safety engineering?
  - Learned game engine programming
  - C, C++, C#, JavaScript
- New path - will work more with VR, programming in FSE in future

Teaching

- Teach several courses
  - Computational fluid dynamics, FDS
    - Started with small part, now course responsible
  - Detection and suppression course
    - Supervising students in project
    - Sprinkler calculations (related to ventilation)
  - Fire safety assessment course
    - Ventilation calculations
    - Supervising CFD/FDS

Teaching

- Created new CFD part in fire dynamics course
  - First time this year – used all knowledge gained teaching other courses

Papers

- Validation of FDS in enclosure fires, novel measuring techniques using ps-LIDAR
- Validation of ventilation in FDS
- Implement new pool fire model in FDS, validate only model but also interaction with ventilation and building
- Two papers with engineering application of validated models

Finishing up

- Put all new knowledge and research in one place – the kappa
  - Create something that is interesting to read and refelects the research done
- Reflect on PhD process
  - What could have been done different? What has been learnt?
- Think about what is next
  - Continue similar work – CFD/FDS
  - Do more VR/Pogramming

Finishing up

- Done!