Instructions

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- The following five files will be output from the interface (under `inputs/` directory):

  - `eweld.in`
  - `eweld_weld_parameters.in`
  - `eweld_boundary_condition.in`
  - `eweld_preheat_interpass_temperature.in`
  - `eweld_temperature_monitor.in`
  - `eweld_mesh_key.txt` (Not need to do now. This option will allow users to input their own meshes.)

- For automatic mesh, the following steps will be run:

  1. Check if `pass_coordinates.out` exists in `input` directory, if no, run `utils/determine_passes_arc_v4.exe` to create `inputs/pass_coordinates.out` [1]:

     ./utils/determine_passes_arc_v4.out inputs/

     `eweld.in` will be input.

  2. Run `utils/Automesh_v14.py` from SALOME's Python Console to create `Mesh_3D.unv`, or run without Salome GUI:

     $SALOMEPATH/salome start -t -w 1 utils/Automesh_v14.py

     (a) The files will be input:
         - `./inputs/eweld.in`
         - `./inputs/eweld_weld_parameters.in`
         - `./setting/Setting_arc_efficiency_dfault.in`

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[1] On Linux, compile `determine_passes_arc_v4.out`, to get `determine_passes_arc_v4.out` via
`gfortran determine_passes_arc_v4.for -o determine_passes_arc_v4.out`

- – `./inputs/pass_coordinates.out`
  (b) The files will be output:
  - – `Mesh_3D.unv`
  - – `model_dflux.for`
  - – `model_step.in`

3. Run

   `python2 tools/unv2calculix.py Mesh_3D.unv Model3d`

   `Model3d.inp` will be created.

4. To generate the `model_film.in` file (using cgx and unical), run:

   `./utils/createFilm.sh Mesh_3D.unv ./utils/write_film.fbd model_film.in`

5. Run

   `python2 utils/Analysis_file_create.py`

   - – The files will be input:
     * `./inputs/eweld.in`
     * `./inputs/eweld_boundary_condition.in`
     * `./inputs/eweld_preheat_interpass_temperature.in`
     * `./Model3d.inp`
   - – The files will be output:
     * `model_bc.in`
     * `model_ele4.in`
     * `model_ele6.in`
     * `model_ele8.in`
     * `model_group.in`
     * `model_ini_temperature.in`
     * `model_material.in`
     * `model_node.in`

6. Move `model_dflux.for` to the CalculiX directory (to `CalculiX-PW/src/`) and rename to `dflux.f` , and compile CalculiX (see the notes in `CalculiX-PW/README.md` for compilation/installation of CalculiX). Or uncompress `tools/CalculiX-PW.tar` (works under Ubuntu 14.04, if all the required packages for CalculiX are installed):

   `tar -xf tools/CalculiX-PW.tar`

7. Run `analysis.inp` with CalculiX