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`

[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:

   ```
   ./createFilm.sh
   ```

5. Run

   ```
   python Analysis_file_create.py
   ```

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

6. Move `model_dflux.for` to the CalculiX directory and rename to `dflux.f`, and compile CalculiX
7. Run `analysis.inp` with CalculiX