Changelog

All notable changes to PSD solver will be documented in this file.

Unreleased

Added

- New accurate force calculations via matrix-vector product: new flag `-getreactionforce`.
- New flag `-reactionforce` variational-based | stress-based to get reaction force on a surface.
- New flag `-plotreactionforce` to activate real time pipe plotting using GnuPlot.

Changed

- Moved to FreeFEM 4.7.
- Moved to PETSc 3.14.

Removed

- Flag `-pipegnu` not supported for damage mechanics (to be further deprecated from elsto/soildynamics)

2.0 - 2020-08-18

Added

- New processing via C++, PSD_PreProcess binary (MAJOR CHANGE).
- New solving via shell wrapper PSD_Solve instead of FreeFem++ or FreeFem++-mpi.
- New examples of using the solver.
- New Pdf documentation containing tutorials, function definitions, verbos on PSD c++ library.
- New option `-nonlinearmethod` (Picard|Newton-Raphsons).
- New time discretization option `-timediscretization`.
- New point boundary conditions.
- New dummy city mesh and analysis 2D for soil dynamics.
- Automatic identification of FreeFEM and Gmsh during `./configure`.
- New flags for `--with-FreeFEM=` and `--with-Gmsh=` during `./configure`.

- New flag `-bodyforceconditions` [int] to include body force.
- New flag `-problem` linear-elasticity | damage | elastodynamics | soildynamics to define physics.
- New flag `-model` to set approximation for damage mechanics hybrid-phase-field | Mazar | pseudo-nonlinear | Hujeux.
- Better energy splitting included Hybrid phase-field compressibility vs tensile energy condition.
- Introduce boundary conditions via `-dirichletconditions` [int] flag.
- Introduce point boundary conditions via `-dirichletpointcondition` [int] flag.
- Introduce traction boundary conditions via `-tractionconditions` [int] flag.
- New folder `tests` containing unit-tests for modules.
- New Hujeux law (nonlinear soil law) interface using C++ class (Thanks to Evelyne Foerster).
- New pseudo-nonlinear model for solving elastodynamics and soildynamics with nonlinear Newton-Raphsons.
- Introduced double couple earthquake source boundary condition for soildynamics.
- New flag `-doublecouple` force-based | displacement-based to use double couple source for soildynamics.
- New top-ii-vol parallel meshing via `-top2vol-meshing` flag (compatible with soildynamics).

Changed

- Moved to FreeFEM 4.6.
- Moved to PETSc 13.13.
- Moved to C++ for preprocessing.
- Moved to shell wrapper PSD_Solve for solving.
- Changes to GFP energydecopostion plugin 'DecompEnergy_Op', now includes compressibility history.
- Replaced GFPDecompEnergy2D/GFPDecompEnergy3D by a generic 2D/3D function GFPSplitEnergy(Eps1[],PsiPlus[],PsiMinus[],HistPlus[],HistMinus[],par);.
- Postprocessing flag `-postprocess` options now support `u` , `v`, `a` , `uv`, `ua`, `av` or `uav`.

Removed

- No more `FFINSTALLDIR` and `GMSH` variables during `make` and `make check`.
- No more `-plot` flag now handled by `-postprocess`.
- No more `-nonlinear` flag now handled by `-problem` and `-model`.
- No more `-bodyforce` flag now handled by an `int` valued `-bodyforceconditions`.

- No more `-dynamic` flag now handled by `-problem` and `-model`.
- No more `-soildynamic` flag now handled by `-problem` and `-model`.
- No more `-quasistatic` flag now handled by `-problem` and `-model`.
- No more `-dirichletbc` flag now handled by `-dirichletconditions`.

Bugs removed

- Bug in 3D paraxial loading (see hash 8fcbe7390e526423cd24b5f0ab1c06899b36c67f)

1.8 - 2020-01-21

Added

- New soil dynamic module `-soildynamics`
- New paraxial element support in 2D.
- New timeplotting support `-timepvd`
- New `-postprocess` option for postprocessing `u` , `v`, `a` , or `uav`.

Changed

- Moved to FreeFEM 4.4.2.
- Moved to PETSc 13.12.
- New simpler way of plotting `savevtk` in parallel with `append` flag for iterative solutions.
- VTU files get stored with a date and time stamp.
- New way of maintaining a logfile for all simulations (date,time,case,..) in `simulation-log.csv`.

1.7 - 2019-11-08

Added

- New mesh reordering via Reverse Cuthill-Mackee via `-useRCM`.
- New quasi-static parallel solver (Extension of B.Masseron & G.Rastiello sequential version).
- New GFP plugin for Mazar's damage update for 2D/3D problems `GFPMazarsDamageUpdate(...)`.
- New MPI plotting routine `plotJustMeshMPI()`.
- New option `-fastmethod` to switch back to default variational formulation.
- New make flag for compiling on supercomputer.

Changed

- Changed variational formulation now using $\epsilon(u) : A : \epsilon(v)$.
- Using GFP becomes optional `-useGFP`.
- Better documentation via `.md` and `.html` files.
- Better plotting support for `PlotMPI()`.
- Moved to FreeFEM 4.4.

1.6 - 2019-06-11

Added

- Dynamic linear solver in 2D and 3D parallel/sequential.
- New finite element variable for partition of unity– for fixing integrals.

Changed

- Better documentation via `.md` and `.html` files.
- Correct quadrature order for faster computations.
- Major changes/splitting of `.script` files.

Removed

- Removed the `BoundaryAndSourceConditions.script` merged with `ControlParameters.script`.

Bugs

- Bug in integrals fixed.

1.5 - 2019-05-29

Added

- Dynamic linear solver in 2D and 3D sequential.
- New meshes for dynamics tests `bar-dynamic.msh`.
- Checking modules `make check`.
- Faster sparsity pattern calculations.

Changed

- Better documentation via `.md` and `.html` files.
- Major restructuring of the codes.
- Moved to `automake` for solver installation.
- Mesh building via `make`.

Removed

- Removed the manufactured solution codes.

1.4 - 2019-05-14

Added

- Fully vectorial finite element solver for phase-filed `-vectorial`.
- New `-supercomp` for avoiding xterm issues on super computers.
- New `MatViz()` function for matrix sparsity visualization.
- Introduced `GFP` plugin support (Go Fast Plugins).

Changed

- Elastic energy decomposition is now optional `-energydecomp`.
- Force calculation using integrals (Thanks to G.Rastiello).

1.3 - 2019-04-08

Added

- New meshes in 2D/3D`Notched-plate` , `square-crack`, etc.
- New fracture mechanics module.
- New `-nonlinear` flag to activate phase-field model for brittle fracture.
- New `-timelog` for time logging the solver.
- New `-pipegnu` for GNUplot piping.

Changed

- Scripting now performed using `.script` files:
  - `BoundaryAndSourceConditions.script`
  - `LinearFormBuilderAndSolver.script`

  - `Macros.script`
  - `Main.script`
  - `VariationalFormulation.script`
  - ....
- Move to FreeFEM version 4.0.
- Move to PETSc version 3.11.

1.2 - 2019-03-18

Added

- Support for Gmsh's `.msh` or Medit's `.mesh` meshes in folder `Meshes`.
- Advance to 3D physics.
- New MPI based parallel solver linear elasticity.
- New approach for solver generation via scripting (PhD thesis MA Badri) with `scriptGenerator.edp`.
- Integrated Domain decomposition macro (PhD thesis MA Badri).
- Customized `.vtk` support for ParaView post-processing.
- New point boundary condition macro `pointbc(Real[int], fespace, matrix)`.
- New flags for communicating with the solver: `-dimension`, `-plot`, `-bodyforce`, `-lagrange`, etc.

Changed

- More advance README.MD.
- Sequential solver now merged within scripting via flag `-sequential`.
- Move to FreeFEM version 3.62.
- Moved manufactured solutions to `validation-test` folder.

1.1 - 2019-03-04

Added

- Initial FreeFEM files for sequential linear elasticity in 2D (case of constrained bar).
- More cases of manufactured solution for linear elasticity in 2D.
- Added README.MD for explaining the solver.
- ParaView plotting activated.

Changed

- Moved to Tuleap git hosting from CEA.
- Separate folder of manufactured solutions and the linear elastic solver.
- Move to FreeFEM version 3.61.

1.0 - 2019-02-15

Added

- Initial FreeFEM files Method of manufactured solution for linear elasticity in 2D.

Version git tags

Version	Git tag
1.0	8a8ecb2746b7da792073358c60df33bae647f788
1.1	a667e6085ba1f92f8dd619bd40e18f85c593bc0a
1.2	e48b7b3a30c05ad4c343efa6a17fee386031f437
1.3	39f43245503658498 52c5264b8d4535aae05e30d
1.4	f51f678630eb9b2fed355e5cedf976ce8b5fa341
1.5	07293ba09a69d3d6a16278220a0b4a7a9f318f96
1.6	f359dd049fb1ddde376e8ad8e5177c663e430418
1.7	aee9bfec868a70b3d9974d7692bc19f9739ab7dc
1.8	2f26292636c7248133e31ae912ee58113de2ef71
1.8	6e721edfafe4ebf3aceebce01e292332a27f980a