

## Pull request and issue summary for acts-project/acts

March 28, 2023

















## Needs discussion I

- ▶  **Expose individual steps of track reconstruction in full\_chain python scripts (#1997)**  
by @tboldagh,

















Discussing the easier way for EF Tracking people to play with ACTS it turned out that it would be beneficial to expose reconstruction pipeline in more details in the top level scripts (at least for the ITK). Having a script where all the steps are clearly visible would encourage people to play with it (e.g. replace one module). The configuration as is (especially seeding) is quite convoluted and general. Presumably we talk here about one workflow with: data prep. -> clusterisation -> sp making -> seeding -> CKF and the candidate to play with is seeding.

This issue is really to hear opinions about it.



















## acts-project/acts: PRs merged between 2023-03-21 and 2023-03-28 |

- ▶  **refactor!: Seeding runs on const inputs (#1948)**  
by @CarloVarni,  reviewed by @LuisFelipeCoelho, merged on 2023-03-21
- ▶  **fix: GSF handles another case of empty components correctly (#1970)**  
by @benjaminhuth,  reviewed by @AJPfleger, merged on 2023-03-21
- ▶  **perf: Reduce memory consumption (#1973)**  
by @CarloVarni,  reviewed by @LuisFelipeCoelho, merged on 2023-03-21
- ▶  **refactor!: SSS Seeding: Store dynamic variables instead of constantly copying them (#1966)**  
by @CarloVarni,  reviewed by @paulgessinger, merged on 2023-03-22
- ▶  **chore: rename unused params (#1952)**  
by @andiwand,  reviewed by @benjaminhuth, merged on 2023-03-22
- ▶  **fix: precision of radLengthPerSeed in ITk configuration (#1969)**  
by @LuisFelipeCoelho,  reviewed by @CarloVarni, merged on 2023-03-22
- ▶  **refactor: SP builder uses SourceLinks instead of Measurements (#1953)**  
by @toyamaza,  reviewed by @CarloVarni, merged on 2023-03-22
- ▶  **refactor: simplify volume drawing and lower case variables (#1962)**  
by @andiwand,  reviewed by @dimitra97, merged on 2023-03-22

















## acts-project/acts: PRs merged between 2023-03-21 and 2023-03-28 II

- ▶  **refactor: optimize examples ambiguity resolution (#1938)**  
by @andiwand,  reviewed by @Corentin-Allaire, merged on 2023-03-22
- ▶  **fix: Propagate layer log level to ITK or disc splitter. (#1977)**  
by @goetzgaycken,  reviewed by @andiwand, merged on 2023-03-22
- ▶  **fix: reduce verbosity of ITK module splitter. (#1976)**  
by @goetzgaycken,  reviewed by @andiwand, merged on 2023-03-22
- ▶  **refactor: Use already retrieved variables (#1978)**  
by @CarloVarni,  reviewed by @paulgessinger, merged on 2023-03-22
- ▶  **feat: MLSolver hashe test and compilation in the CI (#1959)**  
by @Corentin-Allaire,  reviewed by @andiwand, merged on 2023-03-22
- ▶  **refactor: Change transformCoordinates to avoid recalculation of variables in Seedfinder (#1831)**  
by @LuisFelipeCoelho,  reviewed by @CarloVarni, merged on 2023-03-23
- ▶  **refactor: make navigator state copyable (#1979)**  
by @andiwand,  reviewed by @benjaminhuth, merged on 2023-03-23
- ▶  **fix: Alignment Contextual example binary smearing options (#1944)**  
by @paulgessinger,  reviewed by @andiwand, merged on 2023-03-23


















## acts-project/acts: PRs merged between 2023-03-21 and 2023-03-28 III

- ▶  **refactor: restructure onnx examples build (#1960)**  
by @andiwand,  reviewed by @Corentin-Allaire, merged on 2023-03-23
- ▶  **feat: experimental navigator for experimental geometry (#1932)**  
by @andiwand,  reviewed by @asalzburger, merged on 2023-03-24
- ▶  **refactor: Switch all of the Examples to read/write handles (#1939)**  
by @paulgessinger,  reviewed by @andiwand, merged on 2023-03-24
- ▶  **refactor: SSS xyzCoordinateCheck calculations (#1986)**  
by @LuisFelipeCoelho,  reviewed by @CarloVarni, merged on 2023-03-24
- ▶  **refactor: state observer functions for navigator (#1951)**  
by @andiwand,  reviewed by @benjaminhuth, merged on 2023-03-24
- ▶  **refactor: Move check on phi outside z-loop (#1974)**  
by @CarloVarni,  reviewed by @LuisFelipeCoelho, merged on 2023-03-25
- ▶  **refactor!: Add ability to copy Tracks between containers (#1980)**  
by @paulgessinger,  reviewed by @Corentin-Allaire, merged on 2023-03-27
- ▶  **refactor: Ambiguity solvers now use Track containers (#1996)**  
by @Corentin-Allaire,  reviewed by @andiwand, merged on 2023-03-28
- ▶  **refactor: change in ITk seed confirmation for high pT muons efficiency (#1956)**  
by @LuisFelipeCoelho,  reviewed by @CarloVarni, merged on 2023-03-28






















## acts-project/acts: Open PRs |

- ▶  **fix: Track state range is invalid if tip index is (#1995)**  
by @paulgessinger,  **no reviewer**, updated on 2023-03-28
- ▶  **feat: cylindrical detector (#1983)**  
by @asalzburger,  reviewed by @noemina, updated on 2023-03-28
- ▶  **refactor: move vertex performance writer (#1998)**  
by @andiwand,  **no reviewer**, updated on 2023-03-28
- ▶  **feat: Adding ITk scripts for material mapping and validation (#1967)**  
by @noemina,  reviewed by @noemina, updated on 2023-03-28
- ▶  **fix: Skipping un-physical steps in material mapping (#1882) (#1968)**  
by @noemina,  reviewed by @Corentin-Allaire, updated on 2023-03-28
- ▶  **Enable interaction in 'truth\_tracking\_kalman.py' (#1990)**  
by @beomki-yeo,  **no reviewer**, updated on 2023-03-27
- ▶  **perf: Space Point Formation requires functions that accepts const reference to source links (#1991)**  
by @CarloVarni,  **no reviewer**, updated on 2023-03-27
- ▶  **refactor: add propagator stage (#1987)**  
by @andiwand,  reviewed by @benjaminhuth, updated on 2023-03-27

## acts-project/acts: Open PRs II



















- ▶  **feat: Example of integrating HoughTransform example algorithm with python (#1795)**  
by @tboldagh,  reviewed by @paulgessinger, updated on 2023-03-27
- ▶  **refactor: remove/rearrange includes in propagator (#1988)**  
by @andiwand,  reviewed by @andiwand, updated on 2023-03-25
- ▶  **build: Take CMAKE\_CXX\_STANDARD into account (#1981)**  
by @paulgessinger,  reviewed by @benjaminhuth, updated on 2023-03-24
- ▶  **feat: Make layer envelope dimensions configurable (#1982)**  
by @plariono,  **no reviewer**, updated on 2023-03-23
- ▶  **feat: Add logger to multi stepper (#1964)**  
by @benjaminhuth,  reviewed by @paulgessinger, updated on 2023-03-20
- ▶  **Stale fix: Energy loss function (#1323)**  
by @beomki-yeo,  reviewed by @beomki-yeo, updated on 2023-03-18
- ▶  **Stale perf: Tile 8x8 covariance matrix multiplication (#1181)**  
by @stephenswat,  reviewed by @andiwand, updated on 2023-03-18
- ▶   **refactor: explicit init, pre step, post step for navigator interface (#1984)**  
by @andiwand,  **no reviewer**, updated on 2023-03-25

## acts-project/acts: Open PRs III


- ▶   **WIP feat: Refitting algorithm (#1940)**  
by @benjaminhuth,  reviewed by @paulgessinger, updated on 2023-03-24
- ▶   **WIP refactor!: split filterCandidates for ITk SSS seeding (#1985)**  
by @LuisFelipeCoelho,  reviewed by @LuisFelipeCoelho, updated on 2023-03-24
- ▶   **WIP feat: Space point implementation (#1900)**  
by @CarloVarni,  reviewed by @CarloVarni, updated on 2023-03-24
- ▶   **WIP feat: remove middle SPs in last layer (#1972)**  
by @LuisFelipeCoelho,  reviewed by @LuisFelipeCoelho, updated on 2023-03-23
- ▶   **WIP Stale feat!: new cubic volume building (#1821)**  
by @asalzbürger,  **no reviewer**, updated on 2023-03-18
- ▶   **WIP refactor: Change the derivative matrix when rotation angles are small enough (#1943)**  
by @jiaojunkun22,  **no reviewer**, updated on 2023-03-14
- ▶   **WIP feat: GSF add final multi-component state to track container (#1928)**  
by @benjaminhuth,  reviewed by @paulgessinger, updated on 2023-03-09


















## acts-project/acts: Open PRs IV

- ▶   **WIP refactor: Exa.Trkx configurable stages (#1898)**  
by @benjaminhuth,  **no reviewer**, updated on 2023-02-27
- ▶   **WIP Stale docs: adding Fatras description (#1402)**  
by @asalzbürger,  reviewed by @AJPflegler, updated on 2023-02-18
- ▶   **WIP Stale docs: first brush over the geometry pages (#1395)**  
by @asalzbürger,  reviewed by @benjaminhuth, updated on 2023-02-18
- ▶   **WIP Stale refactor: Create and use Acts::SpacePoint as input for public interface of Seedfinder! (#1394)**  
by @robertlangenberg,  **no reviewer**, updated on 2022-11-12
- ▶   **WIP Stale fix: B-field interpolation errors (#1467)**  
by @timadye,  **no reviewer**, updated on 2022-10-12
- ▶   **WIP Stale feat: Adding unit tests for perigee propagation outside beam pipe (#1354)**  
by @asalzbürger,  **no reviewer**, updated on 2022-09-09









- ▶ **Issue with track.nMeasurements() in CKF tracks (#1999)**  
by @pbutti,, updated on 2023-03-28
- ▶ **Expose individual steps of track reconstruction in full\_chain python scripts (#1997)**  
by @tboldagh,, updated on 2023-03-28
- ▶ **vertex fitting and duplicate tracks (#1992)**  
by @rubihason,, updated on 2023-03-28
- ▶ **Improvements to Track EDM (#1993)**  
by @paulgessinger,, updated on 2023-03-27
- ▶ **Bug: Track nTrackStates does not work if there are no track states (#1994)**  
by @paulgessinger,, updated on 2023-03-27
- ▶ **SpacePoint EDM design (#1971)**  
by @CarloVarni,, updated on 2023-03-21

- ▶  **Stale Bug: Unpredictable navigation in layer with overlapping surface (#1852)**  
by @Corentin-Allaire,, updated on 2023-03-25










## acts-project/acts: All stale Issues / PRs I

- ▶  Stale **Bug: Unpredictable navigation in layer with overlapping surface (#1852)**  
by @Corentin-Allaire,, updated on 2023-03-25
- ▶  Stale **fix: Energy loss function (#1323)**  
by @beomki-yeo,  **no reviewer**, updated on 2023-03-18
- ▶   Stale **feat!: new cubic volume building (#1821)**  
by @asalzbürger,  **no reviewer**, updated on 2023-03-18
- ▶  Stale **perf: Tile 8×8 covariance matrix multiplication (#1181)**  
by @stephenswat,  **no reviewer**, updated on 2023-03-18
- ▶   Stale **docs: adding Fatras description (#1402)**  
by @asalzbürger,  **no reviewer**, updated on 2023-02-18
- ▶   Stale **docs: first brush over the geometry pages (#1395)**  
by @asalzbürger,  **no reviewer**, updated on 2023-02-18
- ▶  Stale **Make central minimum track momentum threshold (#1761)**  
by @paulgessinger,, updated on 2023-01-21










## acts-project/acts: All stale Issues / PRs II

- ▶  **Stale Drop 'boost progress' from examples where it is not used (#1736)**  
by @tboldagh,, updated on 2023-01-16
- ▶  **Stale Remove 'volumeSignature' from geometry building (#1731)**  
by @paulgessinger,, updated on 2023-01-16
- ▶  **Stale Optimal seeding parameters for a detector (#1699)**  
by @CouthuresJeremy,, updated on 2023-01-05
- ▶  **Stale Particle smearing assertion with Geant4 (#1603)**  
by @benjaminhuth,, updated on 2022-12-21
- ▶  **Stale Create volume restricted BFieldMap (#1659)**  
by @asalzburger,, updated on 2022-12-21
- ▶  **Stale Documentation update: Core (#1418)**  
by @paulgessinger,, updated on 2022-11-23
- ▶  **Stale Documentation update: Examples (#1420)**  
by @paulgessinger,, updated on 2022-11-23
- ▶  **Stale Documentation update: How-to (core) (#1422)**  
by @paulgessinger,, updated on 2022-11-23










## acts-project/acts: All stale Issues / PRs III

- ▶  **Stale bug: interpolation out of bounds with ATLAS B-field map (#1484)**  
by @timadye,, updated on 2022-11-12
- ▶  **Stale refactor: Create and use Acts::SpacePoint as input for public interface of Seedfinder! (#1394)**  
by @robertlangenberg,,  **no reviewer**, updated on 2022-11-12
- ▶  **Stale Documentation update: Plugins (#1421)**  
by @paulgessinger,, updated on 2022-10-22
- ▶  **Stale Documentation update: FATRAS (#1419)**  
by @paulgessinger,, updated on 2022-10-22
- ▶  **Stale Vertexing produces vertex candidates that are unreasonable (#1361)**  
by @paulgessinger,, updated on 2022-10-22
- ▶  **Stale Add Primary Vertex Label to tracks (#1544)**  
by @Lucas-Borgna,, updated on 2022-10-22
- ▶  **Stale EDM Memory usage (#1516)**  
by @paulgessinger,, updated on 2022-10-22
- ▶  **Stale Documentation update: Contribution guidelines (#1423)**  
by @paulgessinger,, updated on 2022-10-19

## acts-project/acts: All stale Issues / PRs IV









- ▶   **WIP** Stale **fix: B-field interpolation errors (#1467)**  
by @timadye,  **no reviewer**, updated on 2022-10-12
- ▶  Stale **Monitor Floating Point Exceptions in CI (#1481)**  
by @paulgessinger,, updated on 2022-10-01
- ▶  Stale **Optionally have the vertex finding recalculate perigee parameters relative to consistent reference (#1482)**  
by @paulgessinger,, updated on 2022-10-01
- ▶  Stale **Full chain vertexing with AMVF (#1406)**  
by @paulgessinger,, updated on 2022-10-01
- ▶  Stale **Documentation: hints for debugging (#1463)**  
by @timadye,, updated on 2022-09-24
- ▶  Stale **Vertexing produces unexpectedly poor efficiency (#1362)**  
by @paulgessinger,, updated on 2022-09-20
- ▶  Stale **Ambiguous perigees with low momentum (#1386)**  
by @andiwand,, updated on 2022-09-20

## acts-project/acts: All stale Issues / PRs V








- ▶  **Stale** **Vertexing produces propagation errors (#1345)**  
by @paulgessinger,, updated on 2022-09-20
- ▶  **Stale** **add monitoring for vertexing in physmon (#1313)**  
by @andiwand,, updated on 2022-09-20
- ▶  **Stale** **2D r-z Magnetic Field Map Improperly Read (#669)**  
by @osbornjd,, updated on 2022-09-20
- ▶  **Stale** **Fatras: Bethe-Heitler calculation wrong? (#1437)**  
by @asalzbürger,, updated on 2022-09-20
- ▶  **WIP** **Stale** **feat: Adding unit tests for perigee propagation outside beam pipe (#1354)**  
by @asalzbürger,  **no reviewer**, updated on 2022-09-09
- ▶  **Stale** **Some writers performs their writes in the destructor (#881)**  
by @paulgessinger,, updated on 2022-08-11
- ▶  **Stale** **Vertexing issues observed in python vertexing example (#1091)**  
by @paulgessinger,, updated on 2022-08-11
- ▶  **Stale** **Magnetic Field Storage (#1239)**  
by @osbornjd,, updated on 2022-06-12



## acts-project/acts: All stale Issues / PRs VI

- ▶  **Stale** **Reproducibility test using hash checks for non-linear KF (#1246)**  
by @paulgessinger,, updated on 2022-06-12
- ▶  **Stale** **Cut tube segment dd4hep conversion tests (#1146)**  
by @rahmans1,, updated on 2022-05-25
- ▶  **Stale** **Bug: fatras different particle final states between python and executable (#1221)**  
by @CouthuresJeremy,, updated on 2022-05-01
- ▶  **Stale** **ci: Coverage job is broken with gcovr  $\geq$  5.1 (#1211)**  
by @paulgessinger,, updated on 2022-04-29
- ▶  **Stale** **Bug: issue on first build after DD4hep update on system with globally installed acts (#1139)**  
by @gagnonlg,, updated on 2022-02-22
- ▶  **Stale** **Feat: Radial bounds in DD4hep plugin (#822)**  
by @whit2333,, updated on 2022-02-19
- ▶  **Stale** **Add example (+test) for vertex fitting with constraints (#1100)**  
by @paulgessinger,, updated on 2022-01-07
- ▶  **Stale** **Should seed finding tools have a higher-level interface? (#988)**  
by @stephenswat,, updated on 2021-11-25

## acts-project/acts: All stale Issues / PRs VII

- ▶  **Stale [bug] Off axis endcap with dd4hep plugin. (#942)**  
by @whit2333,, updated on 2021-11-25
- ▶  **Stale Improvement: Estimate track parameters from seed at perigee surface (#1036)**  
by @XiaocongAi,, updated on 2021-11-10
- ▶  **Stale Polyhedron surfaces tests are disabled (#454)**  
by @msmk0,, updated on 2021-11-04
- ▶  **Stale Tracking for TPC/DC without surfaces (#165)**  
by @FabianKlimpel,, updated on 2021-11-04
- ▶  **Stale BoundingBox tests fail on double precision (#752)**  
by @paulgessinger,, updated on 2021-11-04
- ▶  **Stale Debug Information in Acts Seeder (#944)**  
by @osbornjd,, updated on 2021-10-21
- ▶  **Stale fix: avoid double-static cast (#647)**  
by @asalzburger,, updated on 2021-10-21