GEOMECHANICA

WE SHOW YOU WHAT HAPPENS NEXT WITH OUR LEADING-EDGE ROCK MECHANICS SIMULATION TECHNOLOGY

GEOMECHANICA

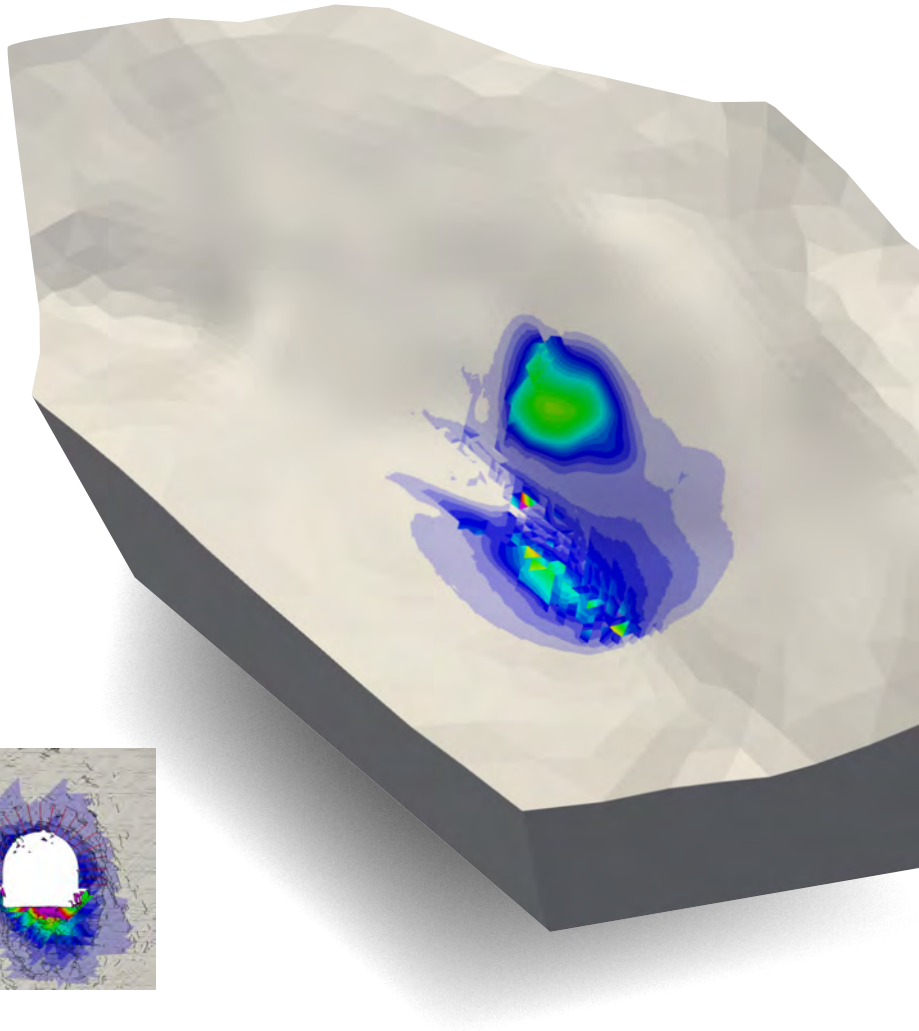
For more details: **irazu.geomechanica.com**
Contact us at: **sales@geomechanica.com**

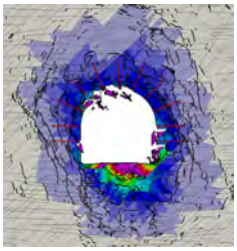
IRAZU

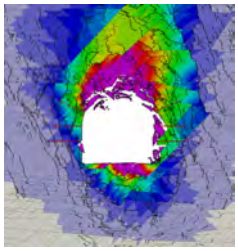
2D/3D Geomechanical Simulation Software

IRAZU is a versatile 2D/3D finite-discrete element software package for the analysis of large deformations, fracturing, and stability in rock masses.

The integration of various multiphysics solvers and advanced features into a single software package enables Irazu to be used for a wide range of engineering applications, including but not limited to excavations, slope stability, tunnelling, dynamic analysis, mining, and reservoir geomechanics. Irazu comes with extensive tutorial, theory, and verification manuals.







SOFTWARE	MECHANICAL SOLVER	FRACTURE SOLVER	HYDRAULIC SOLVER	THERMAL SOLVER
IRAZU 2D/3D	✔	✔	✖	✖
IRAZU 2D/3D HYDRO	✔	✔	✔	✖
IRAZU 2D/3D THERMO	✔	✔	✖	✔
IRAZU 2D/3D SUITE	✔	✔	✔	✔

LICENSING:

LEASE	Leased annually. Includes Maintenance.
FLOATING	Installed on a given number of computers with the license file on a server.
PERPETUAL	Purchased outright. Includes one year of Maintenance.
NODE-LOCKED	Locked to one computer.

MAINTENANCE:

Maintenance includes continuous software updates and expert support. This gives you access to all new features, improvements, and bug fixes throughout the year.

Features

What makes Irazu unique

COMPUTE CAPABILITY

- High performance GPU acceleration
- 64-bit computing
- Explicit mechanical, hydraulic, solid transport, and thermal solvers
- Flexible coupling and sequencing of solvers

DATA INTERPRETATION

- 2D/3D views
- Stress, strain, force, displacement, velocity contours
- Temperature and fluid pressure contours
- Displacement and velocity vectors
- Fracture and failure mode visualization
- Full extension and automation via ParaView
- Export images and animations

MODELLING

- Intuitive graphical user interface
- Interactive geometry creation
- Import DXF files
- Image-based material mapping[1]
- Grid and object snapping
- Material property database
- Layers sidebars
- Excavation staging/sequencing
- Material-based and regional excavations[1]
- Parametric study
- Model snapshots and restart analysis
- Both FDEM and FEM analysis modes
- Fracture nucleation and growth based on nonlinear fracture mechanics
- Various contact models
- Multi-body contact dynamics

FAR-FIELD STRESS

- Constant stress field
- Gravity stress field
- Linearly varying stress field along depth

ROCK JOINTS

- Stochastic Discrete Fracture Network (DFN) generation[1]
- Parallel deterministic, statistical, persistent, or non-persistent joints
- Cross joints
- Import DFN from text or DXF files[1]
- Frictional or cohesive joints

LOADS AND BOUNDARY CONDITIONS

- Surface pressure
- Distributed loads
- Velocities
- Fluid flow rate and pressure
- Borehole flow rate and pressure
- Import pore pressure grids
- Temperature and heat rate
- Proppant volumetric flow rate and concentration
- Dynamic analysis
- Time variation of all boundary conditions

MATERIAL MODELS

- Elastic FEM (Lame, plane stress/strain)
- Isotropic and transversely isotropic stiffness models
- Isotropic and anisotropic strength models
- Mohr-Coulomb failure criterion
- Post-peak yield based on nonlinear fracture mechanics
- Cohesive fracture model
- Coupled finite-discrete element formulation
- Time variation of all material/ strength properties

MESHING

- 2D triangular and 3D tetrahedral mesh
- Full control on mesh sizing at all geometric levels
- Graded or uniform meshing
- Import mesh from other software
- Graphical mesh quality window
- Easy material and boundary condition selection based on geometric entities
- Define mesh refinement zones

THERMAL

- Thermal conduction in solids and fluids
- Thermal advection
- Convective thermal transfer
- Contact thermal transfer
- Thermal deformations and stresses

HYDRAULIC

- Fracture flow
- Carter's leak-off
- Permeable/impermeable fractures and matrix

PROPPANT

- Advective transport
- Proppant settling
- Formation of proppant packs and bridges

ROCK SUPPORT[1]

- Rockbolts
- Elastic and elasto-plastic models
- Full or partial grouting
- Staged support installation
- Passive or active (pre-tensioned)

DOCUMENTATION

- Tutorial manual with example input files
- Verification manual with corresponding input files
- Theory manual covering all implementations

[1]Currently available in Irazu 2D only.

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