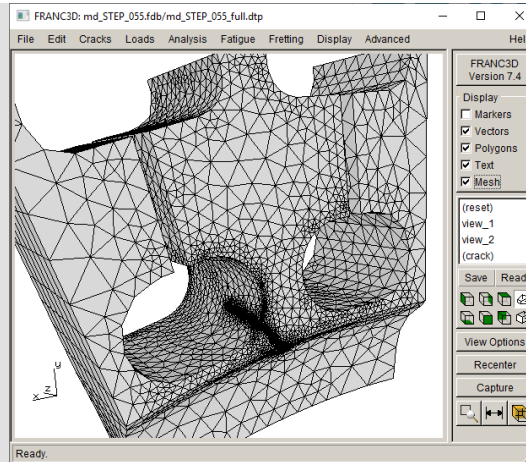


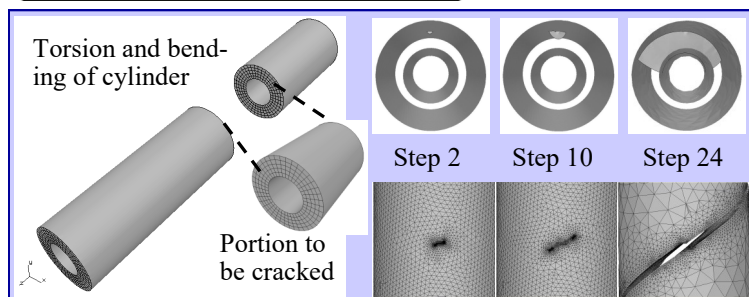
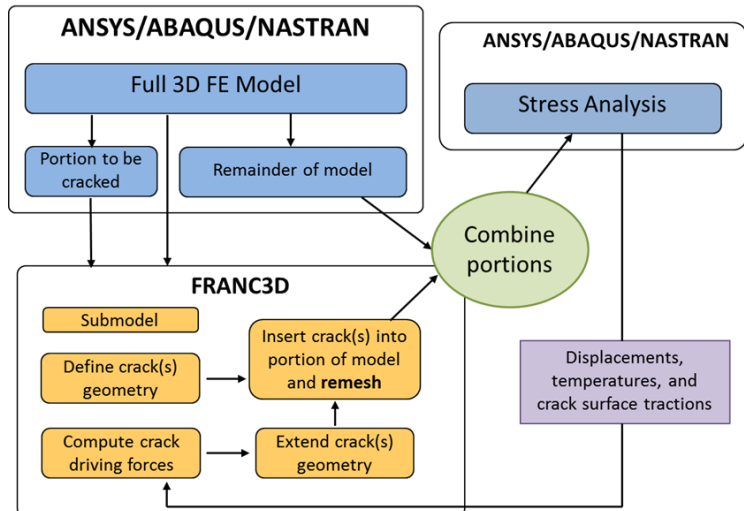
# FRANC3D Version 8

## FRANC3D:

- extracts portion of a 3D FE model,
- inserts one or more cracks,
- re-meshes around the cracks,
- executes a FE analysis program,
- computes fracture parameters,
- extends the cracks,
- displays SIF history, and
- computes fatigue cycles.



Version 8 supports these finite element analysis programs: ANSYS<sup>1</sup>, ABAQUS<sup>2</sup> and NASTRAN<sup>3</sup>. The fatigue life module supports combined low cycle (LC) and high cycle fatigue (HCF) loading. The crack insertion and meshing library allows symmetry surface cracks, embedded bi-material cracks, and cracks that cross bi-material interfaces. The Python interface is based on Python 3.9, but has been tested with older and newer versions of Python 3.



<sup>1</sup> ANSYS is a registered trademark of Ansys, Inc

<sup>2</sup> ABAQUS is a registered trademark of Dassault Systemes Simulia Corp,

<sup>3</sup> NASTRAN is a registered trademark of NASA

Fracture  
Analysis  
Consultants,  
Inc

Fracture simulation and  
software development

121 Eastern Heights Dr  
Ithaca, New York 14850  
support@fracanalysis.com

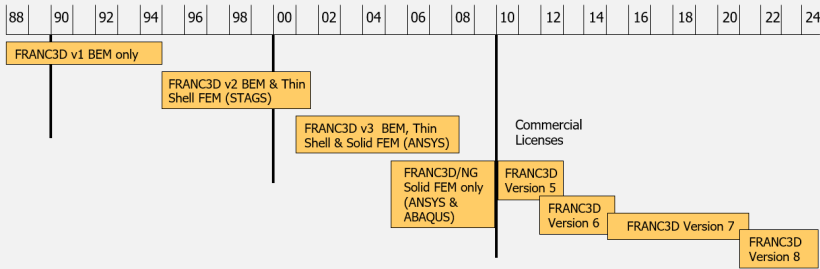
[www.fracanalysis.com](http://www.fracanalysis.com)



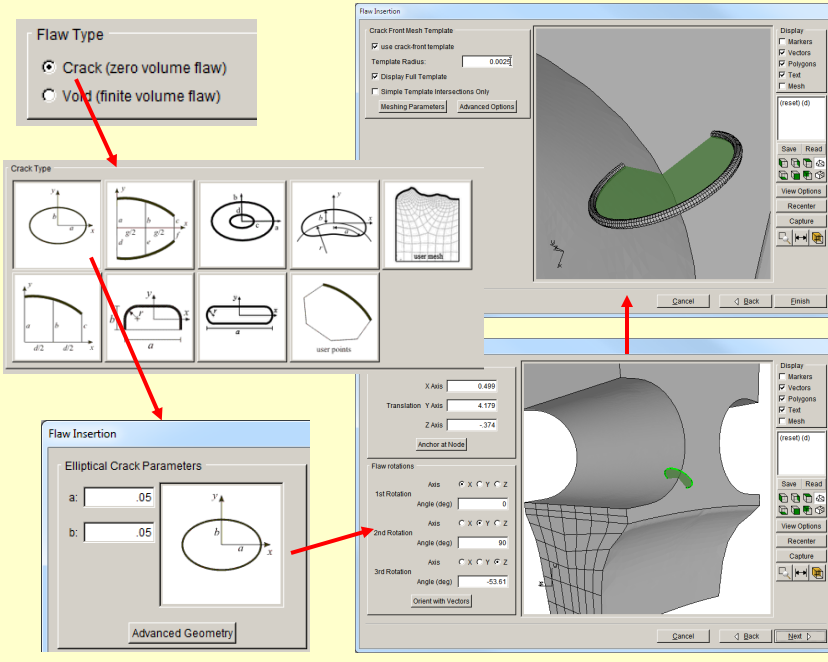
## Features include:

- Simple graphical user interface
- Import and export of ANSYS<sup>1</sup>, ABAQUS<sup>2</sup>, NASTRAN<sup>3</sup> ASCII file formats
- Wizards and dialogs to aid crack insertion, crack growth, and analysis
- Finite volume voids and zero volume cracks
- Crack front template meshes include singular wedge elements or collapsed brick elements for elasto-plastic materials
- Advancing-front tetrahedral meshing with pyramid transition elements, and the ability to use ANSYS<sup>1</sup> or ABAQUS<sup>2</sup> volume meshing
- M-integral stress intensity factor (SIF) calculation allows for anisotropic materials and accounts for temperature changes and crack face tractions or contact pressures
- User-controlled crack growth rules for kink angle and increment
- Fatigue models to define relative crack extension
- Mapping and/or transfer of initial conditions and boundary conditions
- Multiple cracks, multiple crack fronts, and multiple load steps and substeps
- Command (batch) and Python interfaces
- Executables (64 bit) for Microsoft Windows™ and various Linux distributions

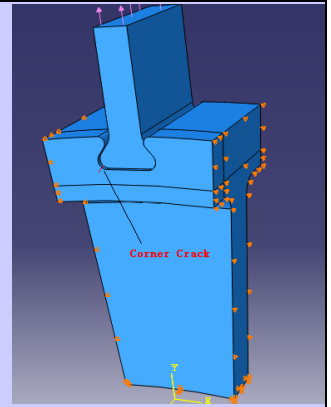
# FRANC3D Development History



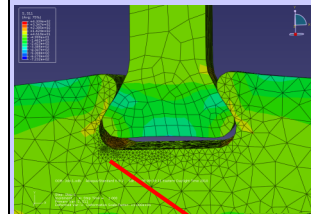
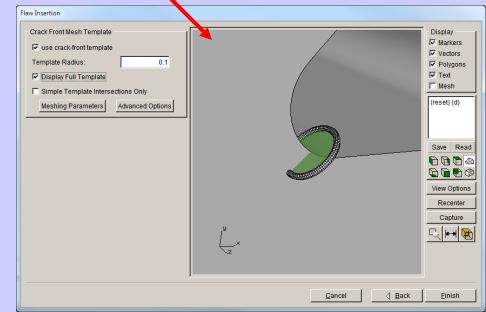
Wizard panels aid crack insertion — leading the user through the steps. A library of parameterized crack shapes is supplemented with user-defined crack (or void) options.



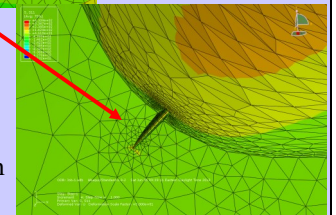
**Blade & disk assembly in ABAQUS with contact between the two parts**



Corner crack insertion

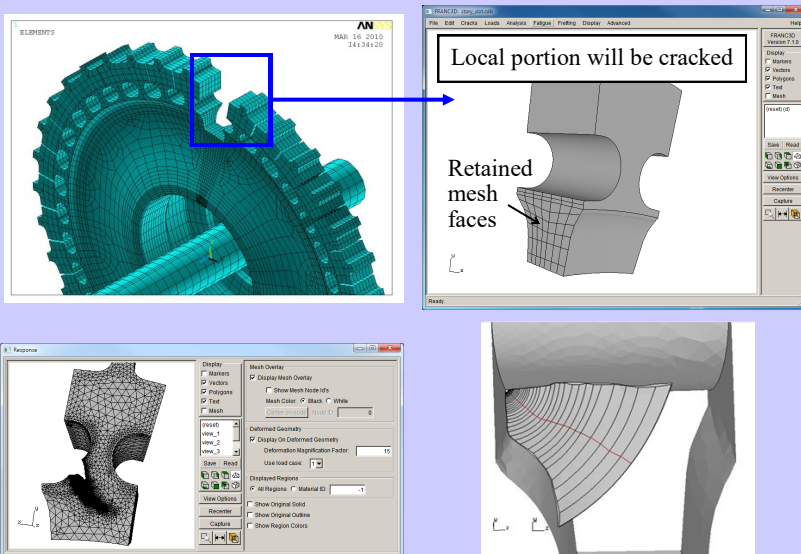


Deformed shape at 10x magnification



at 50x magnification

## Rotating minidisk in ANSYS



Deformed shape at 40 steps of crack growth

SIF history along path through fronts

## Contact Information

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