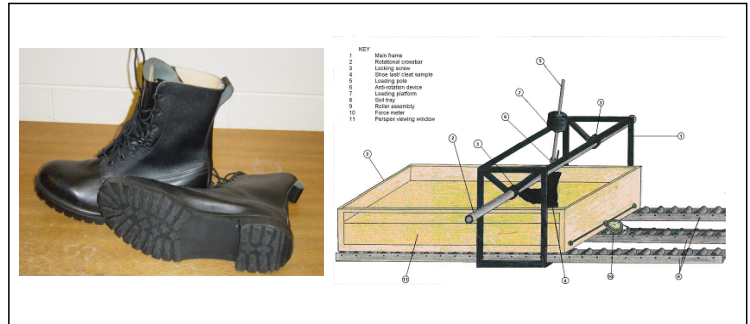


## Multiphysics Modelling of Footwear and Ground Interaction

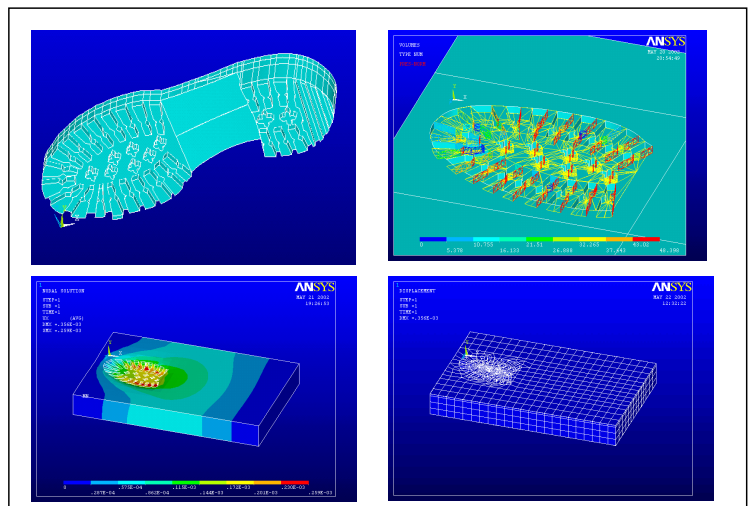
### Objective

Good slip resistant tread patterns of the outer-sole of a military boot are vital to minimize the risk or severity of slip in combat and physical training situations. This study was aimed at how plastic failure of soil mass develops between the relative rigid boot outer-sole (cleats) and soft soil surfaces.



### Methodology

A series of non-linear, three-dimensional finite element analyses of footwear and ground interaction based upon the Drucker-Prager elastic-perfectly plastic material model was investigated using ANSYS.



### Outcome

The numerical analyses indicated that the first tread patterns show the best traction force effects to resist slip in the gaiting direction. In general, the significant soil displacements occur in the regions contacted by cleats at the rear part of the tread patterns and zones under the central part of the tread patterns.

