



Tel: +31 (0)15 278 6071

E-mail: n.irani@tudelft.nl

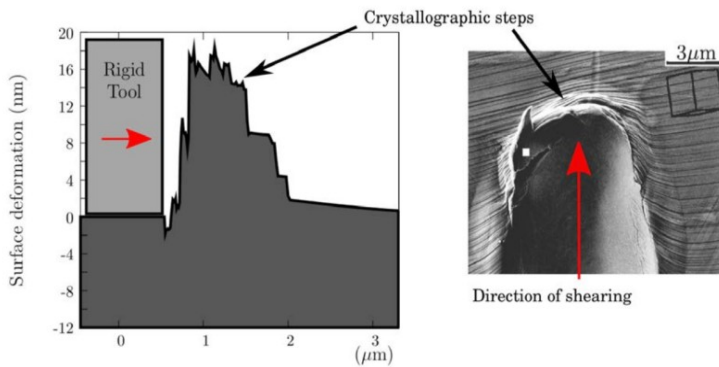
Research interests:

Computational Solid Mechanics Contact
Mechanics
Micro-scale Plasticity

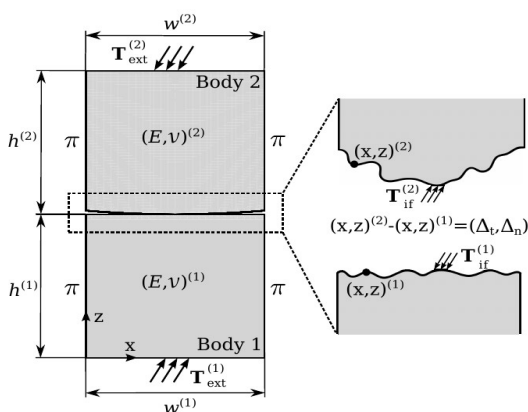
Contact between Deformable Solids

RECENT RESEARCH ACTIVITIES:

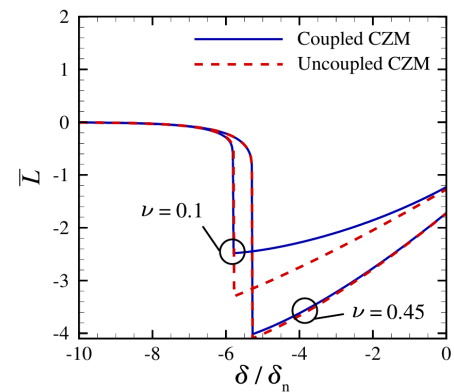
• During plastic deformation, metal surfaces tend to roughen and this directly influences the surface quality of manufactured parts. Plastic deformation and surface roughening in contact shearing of FCC single crystals are investigated using the finite strain discrete dislocation plasticity framework (figure on left):



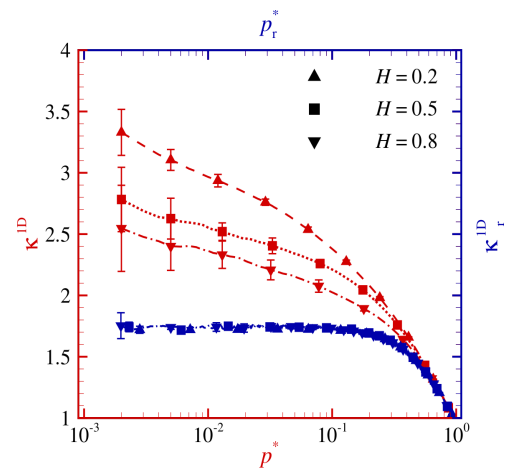
• An atomistically-inspired model is presented to capture the interplay between friction and adhesion in contact. The method relies on Green's function molecular dynamics and on a mixed-mode coupled cohesive zone model.



The importance of the coupling between normal and tangential surface tractions is shown in the load-displacement curves of a rigid circular punch approaching a flat deformable solid:



• In random rough contacts, the root-mean-square gradient (RMSG) of each surface may be determined over the whole surface area \bar{g} or the real contact area \bar{g}_r . The differences between applying the two definitions of RMSG and their corresponding proportionality factors are examined in rough contacts:



KEY PUBLICATIONS:

- Coupling normal and tangential tractions in adhesive contacts (Submitted).
- Proportionality factor in line and surface contacts (In progress).
- Plastic deformation and surface roughening in the contact shearing of single crystals: A finite strain discrete dislocation study (In progress)