POLITECNICO DI MILANO

GMA 2008

Università degli Studi di Genova

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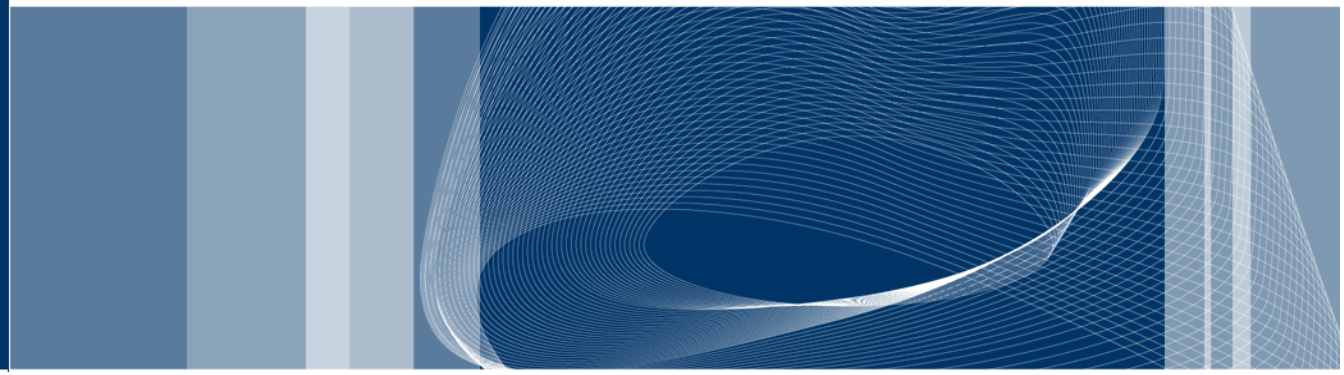


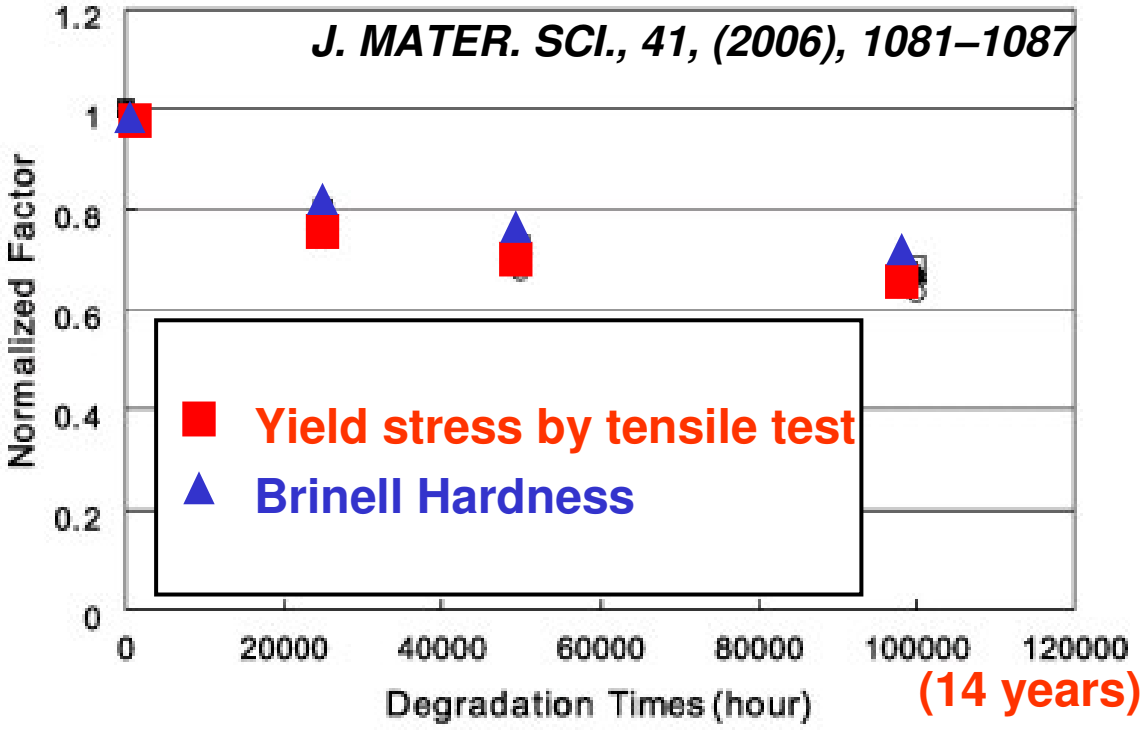
INDENTAZIONE, RILIEVO DI IMPRONTA E RETI NEURALI PER L'IDENTIFICAZIONE DI PARAMETRI COSTITUTIVI

V.Buljak, **E.J.Chiarullo,** G.Maier

Deterioration of mechanical properties

An example:

aging of low-alloy ferritic steel, 1Cr-1Mo-0.25V



Deterioration expected and/or design documents lost

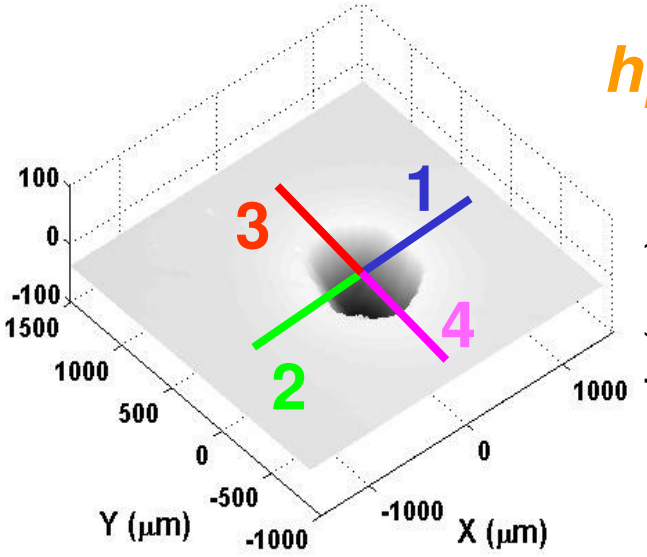
For safety margin computations:

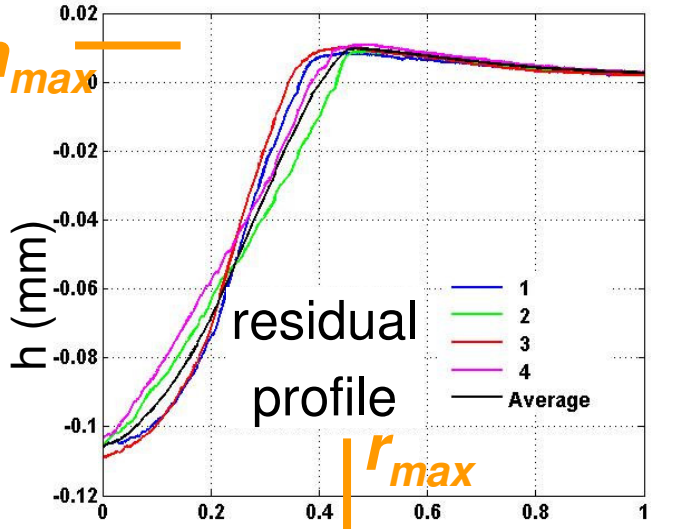
materials parameters ?

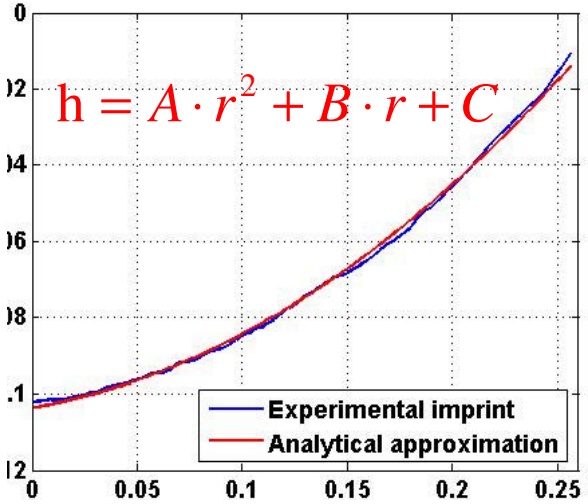
residual stresses in welds?

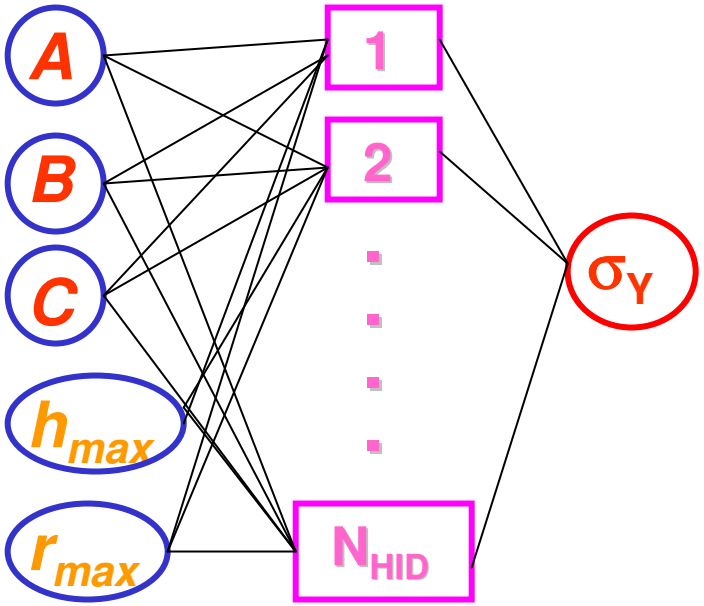
Identification of parameters by ANN

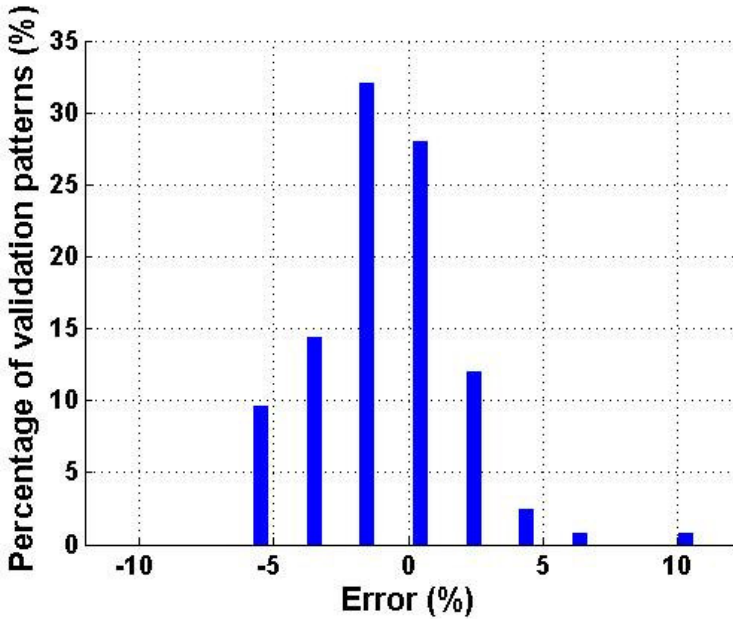
Experimental information carried out by Rockwell B hardness test (1000N) on steel











Conclusion

Indentation tests combined with imprint mapping
and inverse analysis by neural networks (ANN) provides
a promising new method for material characterization
in structural engineering practice

Objectives of research in progress

Experimental data provided by depth sensing indentation

identification of more parameters

Extension to residual stresses

digital image correlation (DIC) for measurements
of imprint surface displacements