

Representative publications from Professor Ted Belytschko

Time Integration

Belytschko, T., Yen, H. J., & Mullen, R. (1979). Mixed methods for time integration. *Computer Methods in Applied Mechanics and Engineering*, 17, 259-275.

Belytschko, T., & Mullen, R. (1978). Stability of explicit-implicit mesh partitions in time integration. *International Journal for Numerical Methods in Engineering*, 12(10), 1575-1586.

Belytschko, T., Smolinski, P., & Liu, W. K. (1985). Stability of multi-time step partitioned integrators for first-order finite element systems. *Computer Methods in Applied Mechanics and Engineering*, 49(3), 281-297.

Neal, M. O., & Belytschko, T. (1989). Explicit-explicit subcycling with non-integer time step ratios for structural dynamic systems. *Computers & Structures*, 31(6), 871-880.

Explicit methods and element technology

Belytschko, T., & Leviathan, I. (1994). Physical stabilization of the 4-node shell element with one point quadrature. *Computer Methods in Applied Mechanics and Engineering*, 113(3), 321-350.

Belytschko, T., Wong, B. L., & Stolarski, H. (1989). Assumed strain stabilization procedure for the 9-node Lagrange shell element. *International Journal for Numerical Methods in Engineering*, 28(2), 385-414.

Belytschko, T., & Tsay, C. S. (1983). A stabilization procedure for the quadrilateral plate element with one-point quadrature. *International Journal for Numerical Methods in Engineering*, 19(3), 405-419.

Belytschko, T., & Neal, M. O. (1991). Contact-impact by the pinball algorithm with penalty and Lagrangian methods. *International Journal for Numerical Methods in Engineering*, 31(3), 547-572.

Meshless methods

Belytschko, T., Lu, Y. Y., & Gu, L. (1994). Element-free Galerkin methods. *International journal for numerical methods in engineering*, 37(2), 229-256.

Belytschko, T., Krongauz, Y., Organ, D., Fleming, M., & Krysl, P. (1996). Meshless methods: an overview and recent developments. *Computer methods in applied mechanics and engineering*, 139(1), 3-47.

Dolbow, J., & Belytschko, T. (1998). An introduction to programming the meshless Element Free Galerkin method. *Archives of Computational Methods in Engineering*, 5(3), 207-241.

Belytschko, T., Guo, Y., Liu, W. K., & Xiao, S. P. (2000). A unified stability analysis of meshless particle methods. *International Journal for Numerical Methods in Engineering*, 48(9), 1359-1400.

X-FEM

Belytschko, T., & Black, T. (1999). Elastic crack growth in finite elements with minimal remeshing. *International journal for numerical methods in engineering*, 45(5), 601-620.

Chessa, J., Smolinski, P., & Belytschko, T. (2002). The extended finite element method (XFEM) for solidification problems. *International Journal for Numerical Methods in Engineering*, 53(8), 1959-1977.

Belytschko, T., Chen, H., Xu, J., & Zi, G. (2003). Dynamic crack propagation based on loss of hyperbolicity and a new discontinuous enrichment. *International Journal for Numerical Methods in Engineering*, 58(12), 1873-1905.

Dolbow, J., Moës, N., & Belytschko, T. (2000). Discontinuous enrichment in finite elements with a partition of unity method. *Finite elements in analysis and design*, 36(3), 235-260.

Chessa, J., Wang, H., & Belytschko, T. (2003). On the construction of blending elements for local partition of unity enriched finite elements. *International Journal for Numerical Methods in Engineering*, 57(7), 1015-1038.

Dolbow, J. O. H. N., & Belytschko, T. (1999). A finite element method for crack growth without remeshing. *Int. J. Numer. Meth. Engng*, 46(1), 131-150.

Chessa, J., & Belytschko, T. (2003). An extended finite element method for two-phase fluids. *Journal of Applied Mechanics*, 70(1), 10-17.

Areias, P., Song, J. H., & Belytschko, T. (2006). Analysis of fracture in thin shells by overlapping paired elements. *Computer Methods in Applied Mechanics and Engineering*, 195(41), 5343-5360.

Song, J. H., Areias, P., & Belytschko, T. (2006). A method for dynamic crack and shear band propagation with phantom nodes. *International Journal for Numerical Methods in Engineering*, 67(6), 868-893.

Bridging Methods

Belytschko, T., Xiao, S. P., Schatz, G. C., & Ruoff, R. S. (2002). Atomistic simulations of nanotube fracture. *Physical Review B*, 65(23), 235430.

Arroyo, M., & Belytschko, T. (2004). Finite crystal elasticity of carbon nanotubes based on the exponential Cauchy-Born rule. *Physical Review B*, 69(11), 115415.

Xiao, S. P., & Belytschko, T. (2004). A bridging domain method for coupling continua with molecular dynamics. *Computer methods in applied mechanics and engineering*, 193(17), 1645-1669.

Xu, M., Gracie, R., & Belytschko, T. (2010). A continuum-to-atomistic bridging domain method for composite lattices. *International journal for numerical methods in engineering*, 81(13), 1635-1658.