



ing. Stefan-Marius BURU

PhD THESIS

ADVANCED ANALYSIS OF STEEL-CONCRETE COMPOSITE STRUCTURES

HIGHLIGHTS

- Nonlinear inelastic analysis method of composite structures is developed;
- Partial composite action is included innovatively at cross-sectional level;
- Tangent flexural and axial rigidity of cross-section are derived;
- Equivalent transverse shear stiffness of beam cross-sections with partial composite action has been derived;
- One 2-noded beam-column flexibility based element per member to simulate partial composite action. distributed plasticity and element geometrical effects;
- Finite-size and semi-rigid joints are included in beam-column element formulation;
- The influence of both partial composite action and shear-flexibility is studied;
- The factors that dominate composite beams behaviour have been highlighted through extensive parametric studies;
- The effects of residual stresses is investigated on composite columns;
- The combined effects of material and geometric nonlinearities are evaluated on composite frames.