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The condition number of a system of equations  $F(x, p) = 0$  parameterised by  $p$  measures the sensitivity of the solution  $x$  with respect to small changes in  $p$ . However, some systems admit infinitely many solutions  $x$  for any given value of  $p$ , in which case the standard condition number is always infinite. This poster presents a generalised condition number (called the least-squares condition number) that is generically finite for many underdetermined systems and measures perturbations to the solution in a least-squares sense relative to some reference solution. The expression of this condition number in terms of the partial derivatives of  $F$  relates it to existing work on complexity (Dedieu and Kim, 2002) and on distance to singularity (Dégot, 2001). The theory is applied to common matrix and tensor factorisations.

*Joint work with Nick Vannieuwenhoven (KU Leuven, Belgium).*