1023-03-1468 **Philipp Gerhardy*** (peegee@daimi.au.dk), Department of Philosophy, Carnegie Mellon University, Pittsburgh, PA 15213. *General logical metatheorems for functional analysis.*

We present general logical metatheorems (joint work with U.Kohlenbach) which state that for large classes of theorems and proofs in abstract functional analysis it is possible to extract effective bounds from sufficiently formal, ineffective proofs. Moreover, these bounds display strong uniformities depending only on very sparse local boundedness conditions. So far, these metatheorems treat general classes of spaces such as metric, hyperbolic, CAT(0), (real) normed, uniformly convex and inner product spaces (as well as product spaces over such spaces) and classes of functions such as nonexpansive, Lipschitz, uniformly continuous, bounded and weakly quasi-nonexpansive ones. These metatheorems have found several interesting applications in metric fixed point theory.

We briefly sketch another area of abstract functional analysis that is highly promising for proof mining: ergodic theory, especially with regard to applications of ergodic theoretic techniques to problems in number theory and combinatorics. Here, the interest is to unwind the combinatorial (i.e. computational) content of the various abstract functional analytic and topological techniques that are used to prove essentially finite combinatorial statements. (Received September 26, 2006)