1150-49-547 **Michael O'Neill*** (moneill@cs.wisc.edu) and **Stephen J Wright**. *A Log-barrier Newton-CG Method for Bound Constrained Optimization with Complexity Guarantees.*

We describe an algorithm based on a logarithmic barrier function, Newton's method, and linear conjugate gradients, that obtains an approximate minimizer of a smooth function over the nonnegative orthant. We develop a bound on the computational complexity of the approach, stated in terms of the required accuracy and the cost of a single gradient evaluation of the objective function and/or a matrix-vector multiplication involving the Hessian of the objective. The method can be implemented without explicit calculation or storage of the Hessian. (Received July 15, 2019)