1023-57-1335 **Chan-Ho Suh*** (suh@math.ucdavis.edu), Department of Mathematics, University of California, One Shields Avenue, Davis, CA 95616-8633. *Menasco normal form and recognizing unknot diagrams.*

We outline a diagrammatic variant of Haken's normal surface theory, which relies only on a knot diagram and not additional structures such as a triangulation. The crucial ingredient is Menasco's crossing bubble technique. Surfaces in the knot complement that can be put into *Menasco normal form* are represented by certain kinds of arcs in regions of the knot diagram. These arcs must satisfy linear equations, giving rise to similar results as with normal surface theory. We will explain these results in the context of the problem of recognizing the unknot, obtain an unknotting algorithm, and show how to improve upper bounds on running time of the algorithm by imposing conditions on the diagram. (Received September 25, 2006)