Abstract. Palpation is routinely being used in open surgery by surgeons to distinguish between normal and abnormal tissues, or detecting the tumors and hidden features as the biological tissue composition and consistency, which often varies from one tissue to another by various diseases. In clinical applications, for more reliable detection of the breast cancer, physicists also need a tactile system more accurate than human fingers. Detection of hidden features within soft tissue in minimally invasive surgery (MIS) is of vital importance. Goal of the present study is development of a Teletaction system comprised of semi-continuous piezoresistive sensor arrays, a three dimensional display and necessary data processing algorithms for graphical rendering of the hidden features through soft tissue. As a result, the surgeon or physicist will be able to determine tumors and arteries by palpating through instruments during surgery or remote palpation. The sensor and display are developed and algorithm is presented. Results for experiments with various configurations of embedded lumps are presented.