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## Signal Processing Technique for Location Estimation

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Determining the location of an object using sensors has become an area of research but some problems arise when some sensor data acts as outliers, for different reasons. Although there have been some proposed solutions to this problem, many run into as problem where multiple external factors affect the effectiveness of the method. Other methods might perform well in removing outliers; however, they are computationally demanding or not effective. There is a way to use algebra in conjunction with signal processing to find an object's location. By doing so, the computations are easy to manage while also providing accurate results. For the 2D case, the time it takes for the signal to travel from a transmitter to a receiver can be modeled with a simple expression that is related to the object position. Then, using the measurement data from multiple sensors we can then solve the unknowns, as long as the number of measurements equals or exceeds the number of unknowns. The object location estimate is the intersection point of the curves from the algebraic expressions and it involves only finding the roots of quadratic equations. A similar procedure can be taken for 3-D localization.