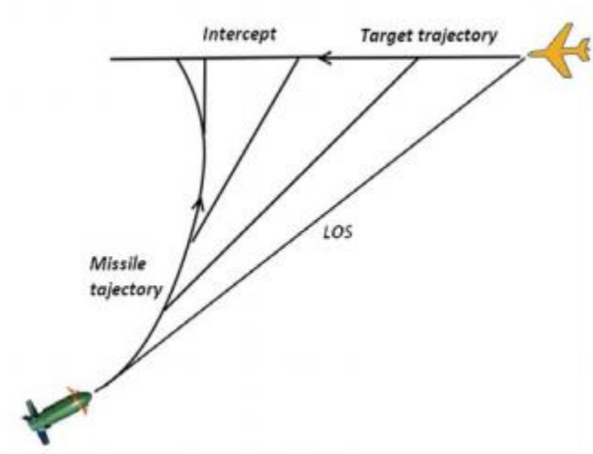
# Self Guided Missile

**Abstract:**

Missile system plays a crucial role especially for distant targets. Missile efficiency depends on the guidance system; the more sophisticate the guidance law/ system the more effective the missile is. Proportional Navigation Guidance System is most effective and widely used technique in missile guidance system.




This system detects the target trajectory (velocity and direction) and predicts the position of target with respect to time. After obtaining required data, missile is launched (missile trajectory) with proportional to the target trajectory and its own velocity considerations.

However, the Proportional Navigation guidance law does not perform well against maneuvering targets. The reason is that though this law accounts for the target velocity implicitly, it does not account for the target acceleration. The path selection of the missile is sensitive and complex work and is done with more precision. If an error had occurred in trajectory selection/ calculation, it results to failure of missile to destroy the target. This system completely depends upon target trajectory and its own velocity (not acceleration). Hence, if target trajectory has changed this system doesn't respond.

This demerit of proportional navigation system can overcome by using self-guided missiles. The name itself indicates that it is self guided; hence the guidance system makes its own decision and trajectory with relative to target. In this live image processing techniques are used which makes it simpler in processing. Tracking of target and its orientations can be obtained by using this technique which reduces hardware complexity. Velocity of target can be obtained by a function of rate of change of pixel and frame rate; hence the need of Doppler radar is eliminated. This missile guidance system can generate accelerations based on target's trajectory and provides effective path to destroy it, by which efficiency of missile can be increased. The trajectory and stability of the missile is controlled by the side propulsion systems (horizontal) and fins. The accuracy of tracking in this system can be made up to 0.001 degree and will have high degree of precision in following the target. Due to self guidance system, it will provide service for different path modes.

Any missile can be converted into self guided by making some hardware changes and guidance mechanism. By using this self guidance system we can improve pre-existing missile technology.