Interesting fact about fitting parameters in your math model

In the SIFT paper (http://www.cs.ubc.ca/~lowe/papers/ijcv04.pdf) David G. Lowe make a reference to

"Many well-known robust fitting methods, such as RANSAC or Least Median of Squares, perform poorly when the percent of inliers falls much below 50%. Fortunately, much better performance can be obtained by clustering features in pose space using the Hough transform (Hough, 1962; Ballard, 1981; Grimson 1990)."

Least median of squares:
http://web.ipac.caltech.edu/staff/fmasci/home/astro_refs/LeastMedianOfSquares.pdf

I don't' know how it works well in practice but at first view it doesn't need to introduce any artificial boundary sigma to find strip of inliers, like it was in RANSAC. However, least square is in general not very robust to the presence of outliers (by it I mean real points, which are not described by our model because of over simplicity of it).

Robust Estimator:

For Least Square there is exist modification – Robust Estimator. Modify cost function such that big outlier do not introduce big error, but give fixed error. (Cost modification should be tuned). The problem of fitting(error minimization) with such modification will lead to non-convex optimization problem.

Ransac and Hough voting:

RANSAC, introduced by Fischler & Bolles in 1981, and Hough Voting have a very cool idea about voting. Such voting schema is genious.

Konstantin Burlachenko (burlachenkok@gmail.com),2016