



Online Localization of Radio-Tagged Wildlife with an Autonomous Aerial Robot System

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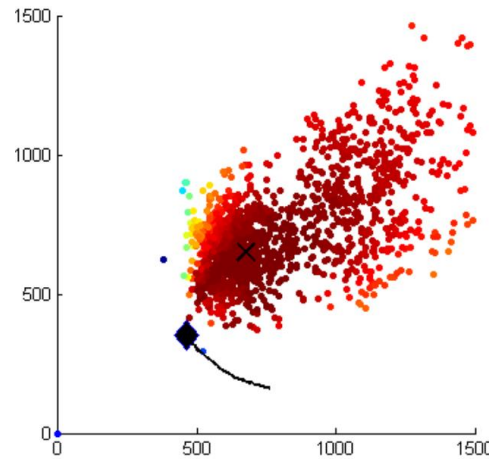
Wildlife Monitoring



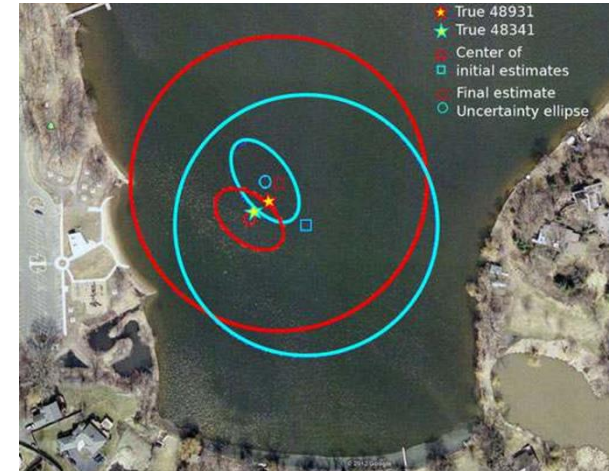
Locating Radio Tagged Wildlife



ASV system monitoring carp in Minnesota lakes with polygonal belief [Tokekar et al, 2010]

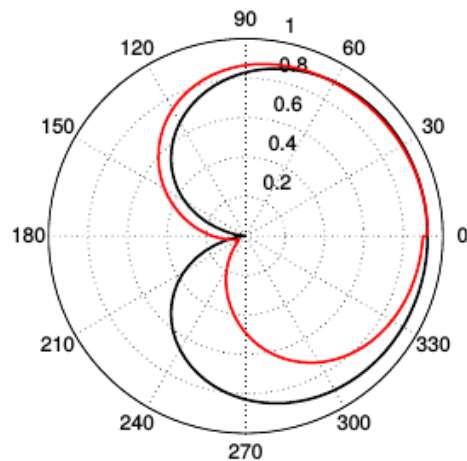
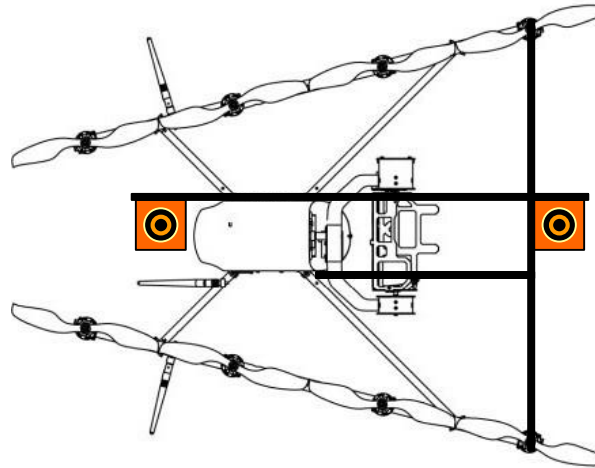


UAV tracking a stationary target with a particle filter belief [Korner et al, 2010]

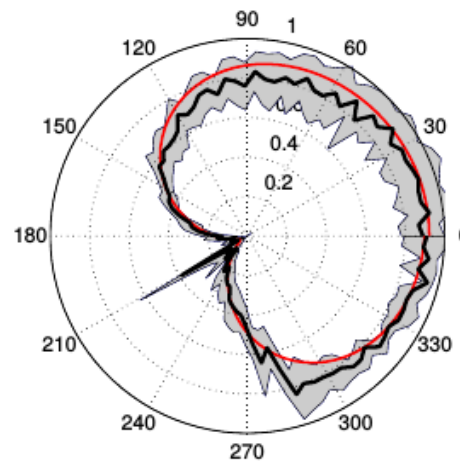


Cautious greedy policy for localizing fish using bearing only observations and Gaussian belief [Vander Hook et al, 2014]

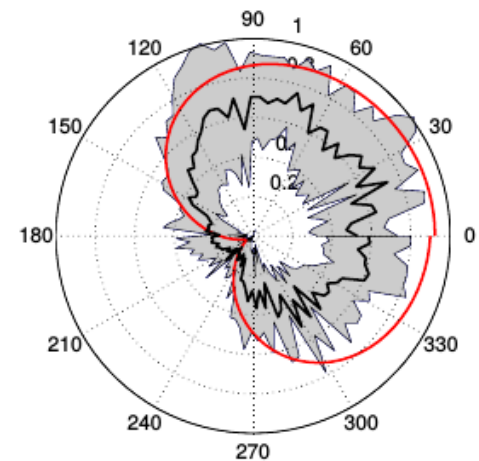
Antenna Model



(a) Theoretical gain



(b) Stationary tag observations

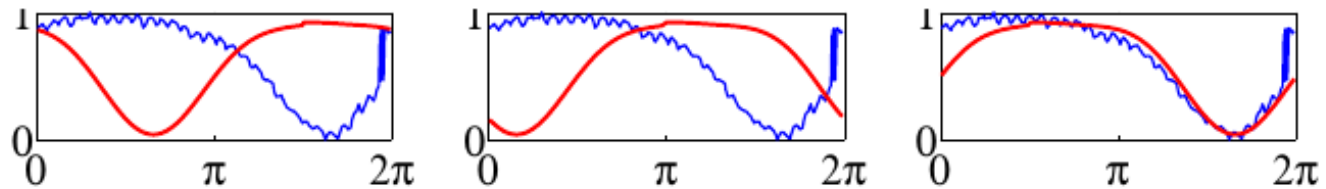
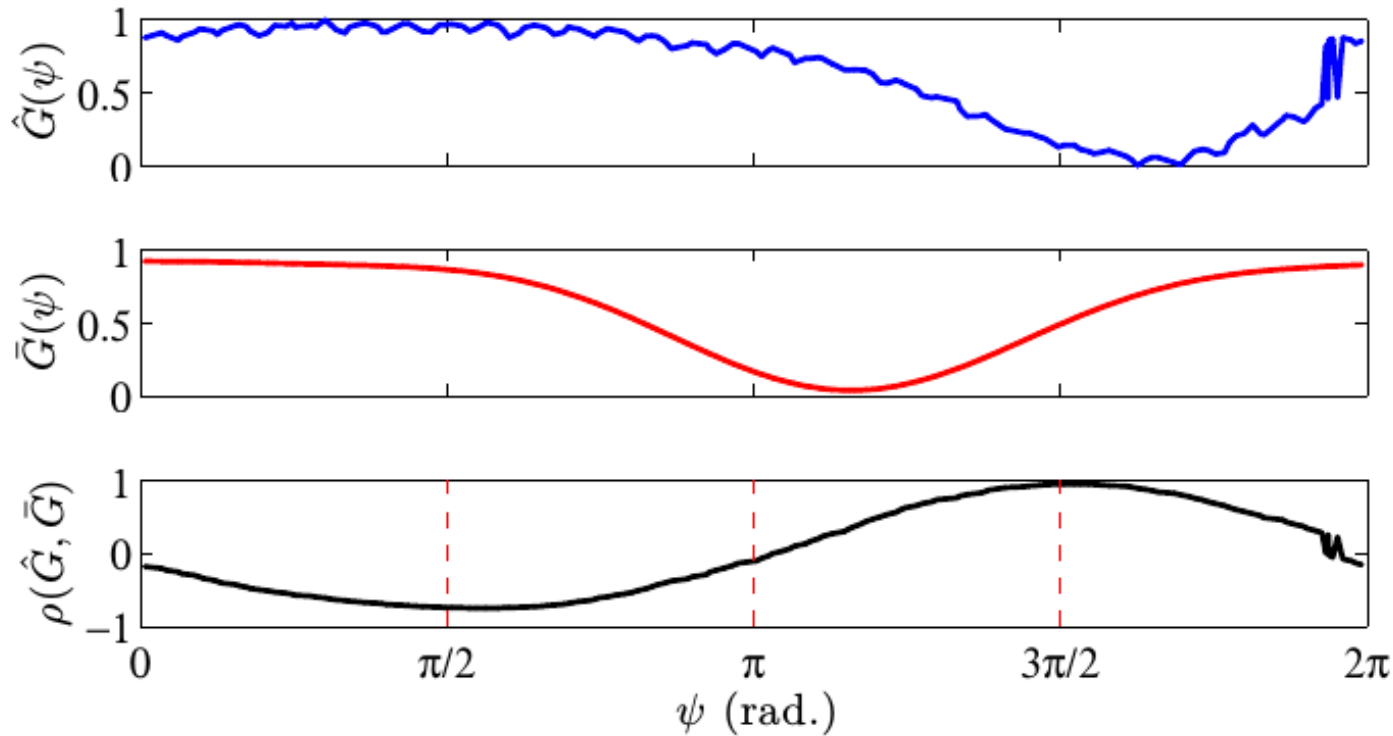


(c) Real bird observations

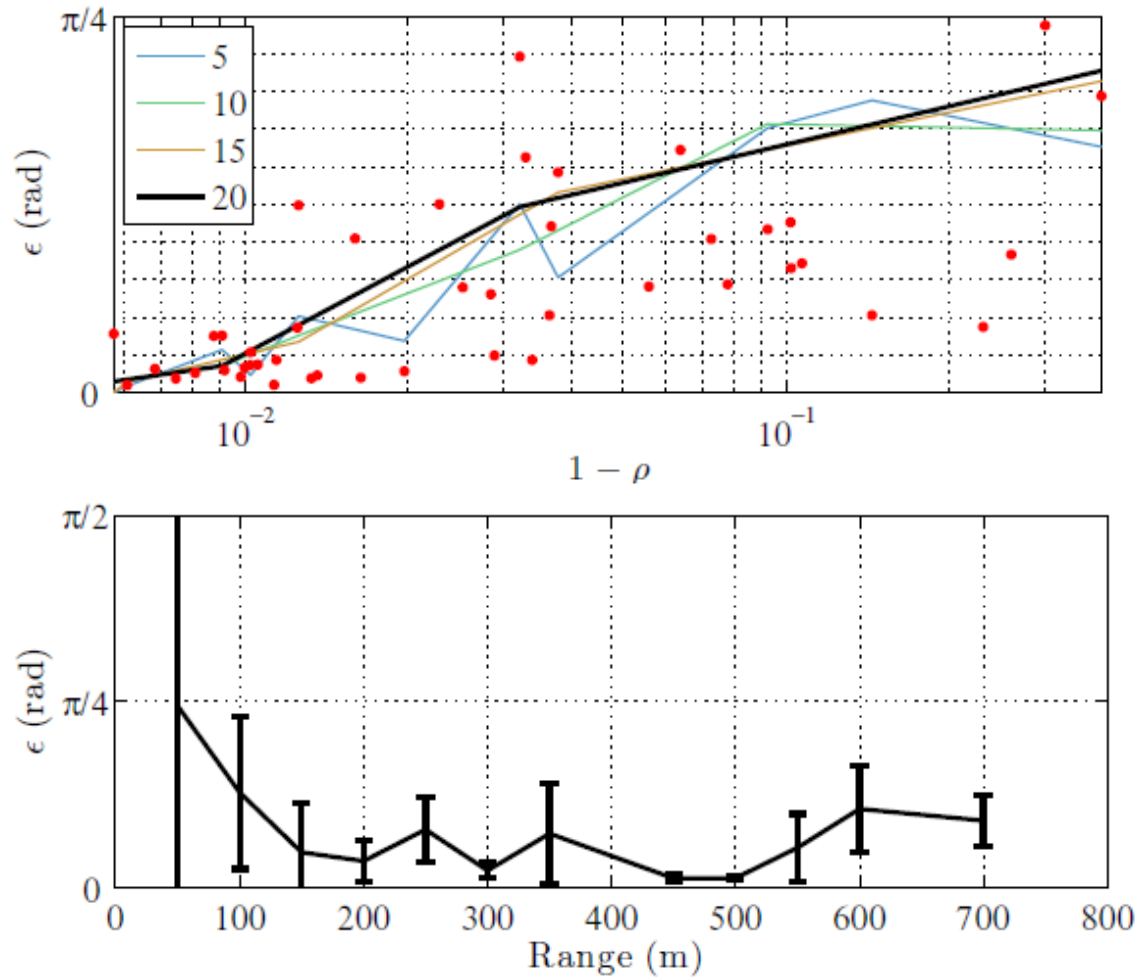
Antenna: Two-Point Phased Array



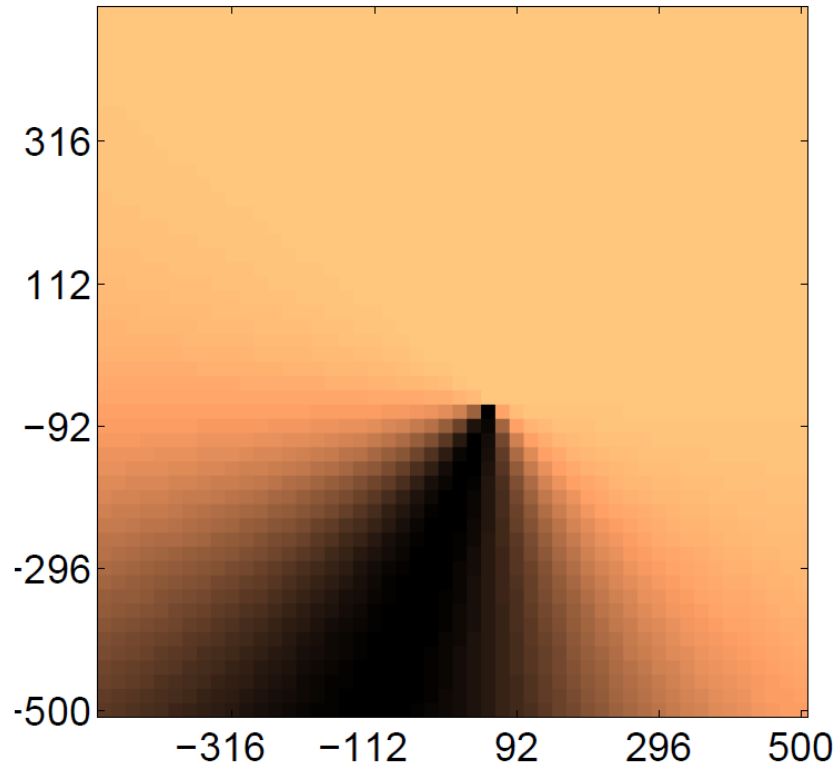
Bearing Observation



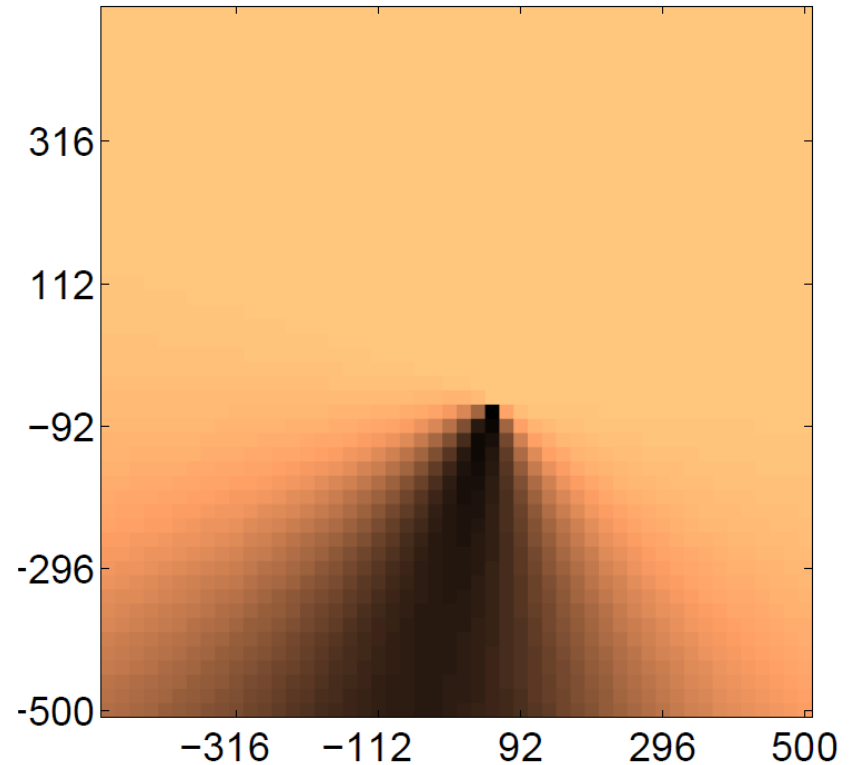
System Identification



Belief Representation and Data Fusion

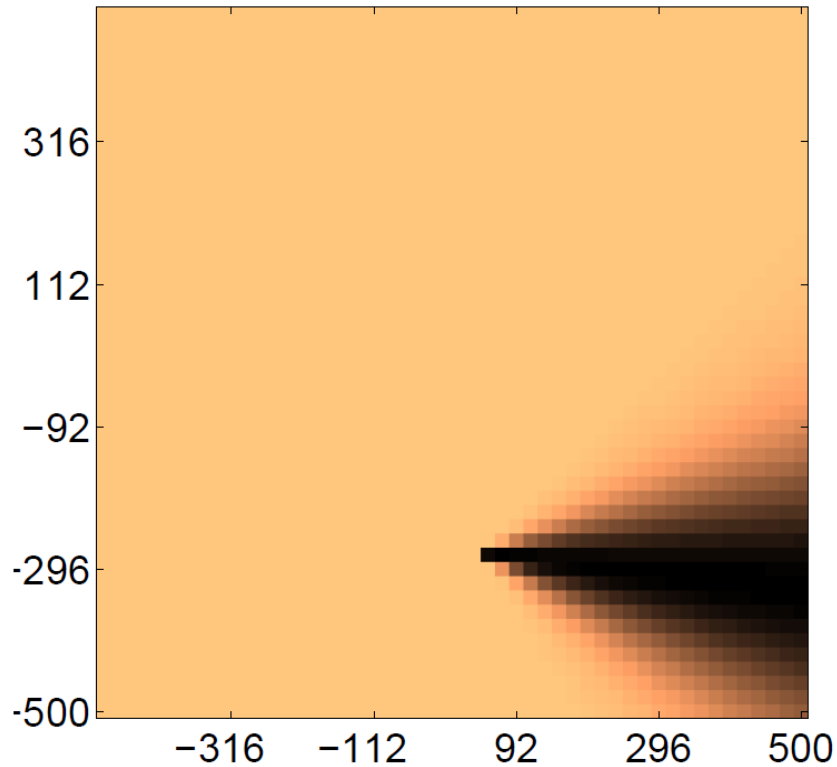


(a) $\rho = 0.86$, $\epsilon = 0.65$, $\hat{\psi} = 2.46$

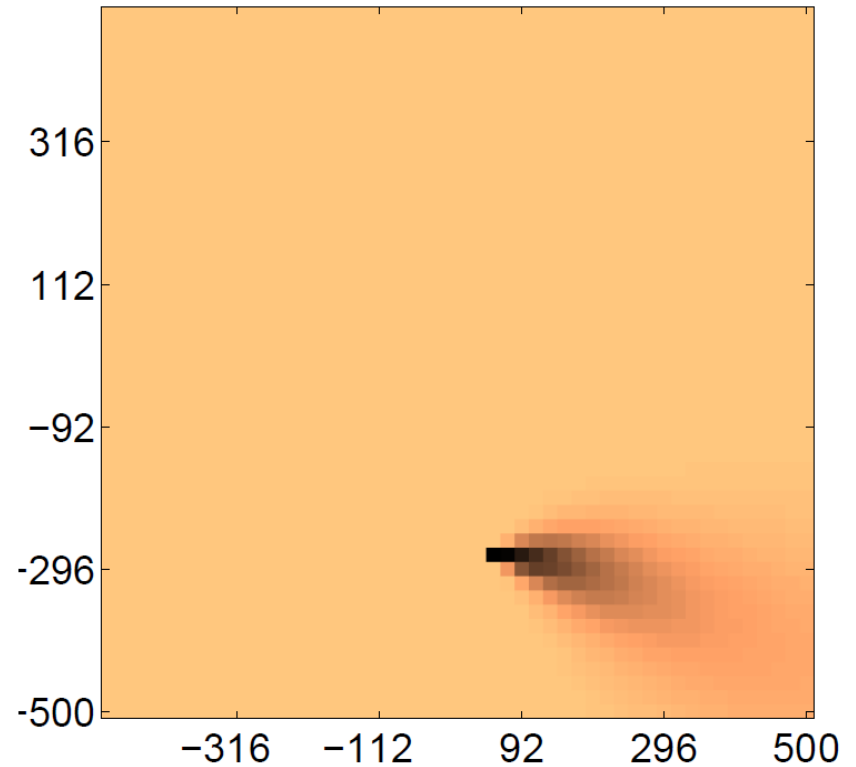


(b) $k = 2$, $H(\xi) = 9.95$

Belief Representation and Data Fusion



(c) $\rho = 0.97$, $\epsilon = 0.31$, $\hat{\psi} = 1.68$



(d) $k = 3$, $H(\xi) = 8.56$

