Fig. 10. The additional links that need to be inserted to create $G^3$ from $G^2$ are shown in this figure.

Fig. 11. Sensing radii to achieve various connectivity and localization objectives.

minimization problem. Despite the inability to solve the noisy equation set (5-6), the apparent solution is to seek those coordinate values of $p(i)$, call them $\hat{p}^*(i)$ for $i \in V_O = V \setminus V_A$ solving the following minimization problem:

$$
\min_{p(i), i \in V_O} \sum_{(i,j) \in D \setminus D_A} \left[ \|p(i) - p(j)\|^2 - (d_{ij}^2 + n_{ij}) \right]^2
$$

subject to $p(i) = \hat{p}(i), \forall i \in V_A$.

Now we know that if all $n_{ij}$ are zero, there is generically a unique solution to the minimization problem, namely, the solution of the usual localization problem, which yields a zero value for the cost function. Let $n$