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READ ME File For 'Dataset for: Efficient Deployment of UAV-powered Sensors for Optimal Coverage and Connectivity'

Dataset DOI: 10.5258/SOTON/D1221

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This is the readme file for the dataset supporting the article entitled "Efficient Deployment of UAV-powered Sensors for Optimal Coverage and Connectivity", which has been accepted for the publication in IEEE Wireless Communications and Networking Conference (WCNC) 2020.

The dataset is for the following figures:

**Fig. 3:** The rectenna efficiency $η$ as a function of input power $P\_{R}$:

**(a)** for the rectenna proposed in [23] (@ $f=868$MHz);

**(b)** for the rectenna proposed in [24] (@ $f=2.45$GHz).

**Fig. 4:** The number of w-p*D*s $N$, coverage rate $D\_{v},$ and coverage lifetime $t\_{T}$ for UAV altitude $h$ and apex angle $θ\_{B}$ ($4$W EIRP (@ $f=868$MHz):

**(a)** $N$ vs. *h* (for $G\_{T}$ of $6$, $9$, $12$, and $15$dBi);

**(b)** $D\_{v}$ vs. *h* (for $G\_{T}$ of $6$, $9$, $12$, and $15$dBi);

**(c)** $N$ and $D\_{v}$ vs. $θ\_{B}$ and $t\_{T}$ vs. $θ$ (for $∆\_{UAV}$ of 140m2).

**Fig. 5:** The number of w-p*D*s $N$ and coverage rate $D\_{v}$ for the increasing size of event area $∆\_{UAV}$:

**(a)** $N$ vs. $∆\_{UAV}$ (for $G\_{T}$ of $12$, $15$, and $18$dBi, $4$W EIRP @ $f=868$MHz);

**(b)** $D\_{v}$ vs. $∆\_{UAV}$ (for $G\_{T}$ of $12$, $15$, and $18$dBi, $4$W EIRP @ $f=868$MHz).

**Fig. 6:** The effect of increasing EIRP on the number of w-p*D*s $N$ and coverage rate $D\_{v}$ for varying UAV altitude $h$:

**(a)** $N$ vs. $h$ (for EIRP of $≈4$, $6.31$, $10$, and $15.85$W @ $f=2.45$GHz);

**(b)** $D\_{v}$ vs. $h$ (for EIRP of $≈4$, $6.31$, $10$, and $15.85$W @ $f=2.45$GHz).

**Fig. 7:** The required number of w-p*D*s $N$ to achieve different target coverage rates $D\_{v}$ for the increasing size of event area $∆\_{UAV}$ ($θ\_{B}≈30⁰$, $4$W EIRP @ $f=868$MHz). p.s. the dashed red line shows $N$ that can be fit in the given $∆\_{UAV}$ (with respect to system parameters), where achievable $D\_{v}$ for that particular $N$ is shown in orange.

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**Related projects:** EP/P010164/1

**Date of data collection:** from August 2019 - November 2019

**Information about geographic location of data collection:** University of

Southampton, U.K

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