Algorithm 1 CD2XMappingInit(XRegionSet X)

Initialize $CovD2X$, $IntD2X$, $CovC2X$, $IntC2X$;
RTree $rt \leftarrow \emptyset$;
for each device dev in D **do**
    Add $Cir(Loc(dev), Rad(dev))$ into rt;
for each cell c in C **do**
    Add the spatial extent of c into rt;
for each X-region x in X **do**
    ResultSet $covR \leftarrow$ Search(rt, x, $COVER$);
    for each item a in $covR$ **do**
        if a indicates device dev's detection range **then**
            $CovD2X[dev] \leftarrow x$;
        else if a indicates cell c's detection range **then**
            $CovC2X[c] \leftarrow x$;
    ResultSet $intR \leftarrow$ Search(rt, x, $INTERSECT$);
    for each item a in ($intR \setminus covR$) **do**
        if a indicates device dev's detection range **then**
            $IntD2X[dev] \leftarrow IntD2X[dev] \cup \{x\}$;
        else if a indicates cell c's detection range **then**
            $IntC2X[c] \leftarrow IntC2X[c] \cup \{x\}$;