Guidelines for Student Reports

SVILUPPO DI UN TOOL GRAFICO PER LA GESTIONE DI AUTENTICAZIONE E RICONFIGURAZIONE IN UNA WSN TRAMITE SMART ANTENNAS

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Abstract

Il progetto prevede lo sviluppo di un tool grafico per la riconfigurazione di una Wireless Sensor Network in scenari tempo-varianti. Il software permette di gestire scenari 2-d nei quali vengono posizionati i nodi, tali nodi sono dotati di smart antennas per orientare il lobo principale verso gli elementi della rete che hanno soddisfatto i requisiti di autenticazione (amici) e posizionare dei nulli nel beam-pattern in corrispondenza dei nodi che non si sono autenticati (nemici). I nodi possono cambiare la loro posizione nel tempo quindi ad intervalli regolari ognuno di essi effettua uno scan sui 360 gradi (rotazione del lobo principale) per individuare le nuove posizioni relative e riconfigurare il proprio diagramma di radiazione in base ai risultati delle autenticazioni. Il beam-pattern viene controllato agendo sui pesi e sulle fasi della smart antenna, tali valori sono le variabili da ottimizzare tramite Particle Swarm Optimizer (PSO). L'applicazione permette di aggiungere e togliere elementi della WSN nonchè di visualizzare i beam-pattern al variare della posizione dei nodi per apprezzare le capacità riconfiguranti del metodo. Tutti i parametri di configurazione della rete (numero sensori, numero elementi dell'antenna, potenza tx, intervallo temporale scan, larghezza lobo principale nello scan, parametri dell'ottimizzatore PSO,...) sono modificabili attraverso l'interfaccia grafica per rendere il software più controllabile e scalabile possibile.

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