

Opdracht:  ← aangeven of het een stage- en/of afstudeeropdracht is (eventueel aangeven voor één of twee studenten)

Afdeling:  ← volledige afdelingsnaam

Studierichting:  ← één of meerdere studierichtingen aangeven

Niveau:  ← MBO/HBO/WO (en/of)

Achtergrond: ← achtergrondinformatie van de afdeling en de werkzaamheden

Thales Land & Joint Systems Netherlands (TNL) is the world market leader in multimedia communication networks for vehicles and small platforms. The company is supplier of high quality integrated communications systems for both commercial organisations and armed forces. TNL has developed the first ruggedized high bandwidth data switch to be used in multimedia command post vehicles. Vehicles can be connected in any order and in any topology using fibre optical cables. TNL also provides all major railway stations in the Netherlands with SmartSwitch: a multimedia switching network. With this network all on-station TV cameras can be monitored from a central operations room in Amsterdam. Thales Land & Joint Systems in Huizen has been prime contractor for the development of an essential part of the D2S2 (Dutch Dismounted Soldier System), the Communication and Information Module (CIM). The company is based in Huizen and has around 300 employees of which 150 engineers are in Research and Development. Thales expertise in this domain is zero-configuration ad-hoc networks providing maximal connectivity for maximum duration, using algorithms to minimize the overall system power consumption in nodes while maintaining robust networks at all times.

Titel Opdracht:

← éénregelige samenvatting

Opdrachtomschrijving:

For personal communication systems, energy consumption must be minimized: a more efficient use of energy will reduce the weight and the volume of the equipment and will prolong the lifetime of the network. Batteries are responsible for about half of the volume and a significant portion of the weight of the equipment. In addition, replacing or recharging of batteries is expensive and sometimes even impossible. As transmission power is an important contributor to the energy consumption of a device, one of the questions is to minimize the total transmission power assigned to nodes in a network. There is a lot of literature available on minimisation of total transmission power under the restriction that the resulting network must be connected. However, it seems that the question of total minimisation of total transmission power, with the restriction that the 'diameter' (i.e., the maximum distance from a source to a destination) in the resulting network is 'short' (e.g. at most 1 or 2 hops) has been less well studied.

Goal of the assignment is to (a) develop algorithms for minimizing the transmit power in networks, under the restriction that the diameter of the resulting network is low; (b) analyse the performance of the developed algorithms by comparing the algorithm results to optimal solutions for networks of small diameter; and ---if time permits -- (c) to implement an algorithm in an example network of sensor nodes.

Affiniteit met:

Vakkenpakket:

Afdelingsstagecoördinator:

← voor- en achternaam

Stagebegeleider:

← voor- en achternaam