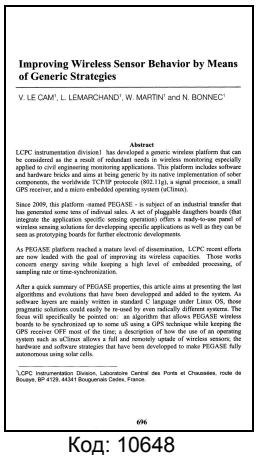

Improving Wireless Sensor Behavior by Means of Generic Strategies

V. LE CAM[1], L. LEMARCHAND[1], W. MARTIN[1] and N. BONNEC[1]

Abstract

LCPC instrumentation division1 has developed a generic wireless platform that can be considered as the a result of redundant needs in wireless monitoring especially applied to civil engineering monitoring applications. This platform includes software and hardware bricks and aims at being generic by its native implementation of sober components, the worldwide TCP/IP protocole (802.11g), a signal processor, a small GPS receiver, and a micro-embedded operating system (uClinux).

Since 2009, this platform -named PEGASE - is subject of an industrial transfer that has generated some tens of indivual sales. A set of pluggable daugthers boards (that integrate the application specific sensing operation) offers a ready-to-use panel of wireless sensing solutions for developping specific applications as well as they can be seen as prototyping boards for further electronic developments.

As PEGASE platform reached a mature level of dissemination, LCPC recent efforts are now leaded with the goal of improving its wireless capacities. Those works concern energy saving while keeping a high level of embedded processing, of sampling rate or time-synchronization.

After a quick summary of PEGASE properties, this article aims at presenting the last algorithms and evolutions that have been developped and added to the system. As software layers are mainly written in standard C language under Linux OS, those pragmatic solutions could easily be re-used by even radically different systems. The focus will specifically be pointed on: an algorithm that allows PEGASE wireless boards to be synchronized up to some uS using a GPS technique while keeping the GPS receiver OFF most of the time; a description of how the use of an operating system such as uClinux allows a full and remotely uptade of wireless sensors; the hardware and software strategies that have been developped to make PEGASE fully autonomous using solar cells.

[1]LCPC, Instrumentation Division, Laboratoire Central des Ponts et Chaussées, route de Bouaye, BP 4129, 44341 Bouguenais Cedex, France.

696

Код: 10648

V. Le Cam, L. Lemarchand, W. Martin, N. Bonnec

Improving Wireless Sensor Behavior By Means Of Generic Strategies

Издательство DEStech Publications, Lancaster, 2010 год

8 стр; формат: 23,5 x 16 см; библиографический список: 10 единиц
ISBN: 978-1-60595-024-2

LCPC instrumentation division1 has developed a generic wireless platform that can be considered as the a result of redundant needs in wireless monitoring especially applied to civil engineering monitoring applications. This platform includes software and hardware bricks and aims at being generic by its native implementation of sober components, the worldwide TCP/IP protocole (802.11g), a signal processor, a small GPS receiver, and a micro embedded operating system (uClinux).

Since 2009, this platform -named PEGASE - is subject of an industrial transfer that has generated some tens of indivual sales. A set of pluggable daugthers boards (that integrate the application specific sensing operation) offers a ready-to-use panel of wireless sensing solutions for developping specific applications as well as they can be seen as prototyping boards for further electronic developments.

As PEGASE platform reached a mature level of dissemination, LCPC recent efforts are now leaded with the goal of improving its wireless capacities. Those works concern energy saving while keeping a high level of embedded processing, of sampling rate or time-synchronization.

After a quick summary of PEGASE properties, this article aims at presenting the last algorithms and evolutions that have been developped and added to the system. As software layers are mainly written in standard C language under Linux OS, those pragmatic solutions could easily be re-used by even radically different systems. The focus will specifically be pointed on: an algorithm that allows PEGASE wireless boards to be synchronized up to some uS using a GPS technique while keeping the GPS receiver OFF most of the time; a description of how the use of an operating system such as uClinux allows a full and remotely uptade of wireless sensors; the hardware and software strategies that have been developped to make PEGASE fully autonomous using solar cells.

Ключевые слова:

Содержание.