器件驱动与控制

投射电容式触摸屏自适应检测系统的设计

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摘要： 为了减少投射电容式触摸屏互电容的检测数量，提出了一种自适应检测算法，并对该算法进行分析和验证。将整个投射电容式触摸屏抽象成一个网格，互电容为网格横纵的交错点。分析网格横纵2个方向变阈值的自适应扫描，并将其与逐行扫描法进行对比。设计出以FPGA为控制核心、外加检测电路的自适应检测系统对该算法进行验证。实验结果表明，对电极间距为1 mm，驱动区为71×54的投射电容式触摸屏，在识别点数分别为3、2、1时，与采用传统的逐行扫描法相比，采用自适应检测法需要的检测次数分别相应地减少为1/5.0、1/6.5、1/10.4，有效地缩短了触摸信息的检测时间，对投射电容式触摸屏在大尺寸方向的发展与应用有积极意义。

关键词： 投射电容式　互电容　自适应检测

Design of adaptive detection system of projected-capacitive touch-screen

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Abstract: In order to reduce the detection times of the mutual capacitance of projected-capacitive touch-screen, an adaptive detection algorithm is proposed, parsed and validated. First of all, the entire projected-capacitive touch-screen is abstracted into a grid, and each crossing point of the grid represents a mutual capacitance.Then an adaptive scanning method based on variable threshold in both directions is analyzed and contrasted with the progressive scanning method. Finally,an adaptive detection system is designed, which includes a FPGA as the center control unit and other detection circuit to verify the algorithm. Experimental results show that compared with traditional progressive scan method, the detection number of adaptive detection method needs correspondingly reduce for 1/5.0, 1/6.5, 1/10.4 respectively under the conditions that the identification points is from 3 to 1 and the projected-capacitive touch-screen which electrode spacing is 1 mm and the driving area is 71×54.The detection time of touch information is effectively shorten, which is meaningful for projected-capacitive touch-screen's development in the direction of large-size application.

Keywords: projected-capacitive　mutual capacitance　adaptive detection

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