Nanorobots, NEMS, Nanoassembly, Control and Sensors

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ABSTRACT

Nanorobotics encompasses the design, fabrication and programming of robots with overall dimensions below a few micrometers, and the programmable assembly of nonsocial objects. Nanorobots are quintessential nanoelectromechanical systems (NEMS) and raise all the important issues that must be addressed in NEMS design: sensing, actuation, control, communications, power, and interfacing across spatial scales and between the organic/inorganic and biotic/abiotic realms.

In this paper presentation I have tried to use the idea of nanorobots to design an own autonomous robot that can be used for medical and mechanical purposes and hence can be used in any field. This paper discusses the various calculations involved in making the rebot and its neseccary design in making the sensor too.
Nanorobots are expected to have revolutionary applications in such areas as environmental monitoring and health care. This paper begins by discussing nanorobot construction, which is still at an embryonic stage. The emphasis is on nanomachines, an area which has seen a spate of rapid progress over the last few years. Nanoactuators will be essential components of future NEMS. The paper's focus then changes to nanoassembly by manipulation with scanning probe microscopes (SPMs), which is a relatively well established process for prototyping nanosystems. Prototyping of nanodevices and systems is important for design validation, parameter optimization and sensitivity studies. Nanomanipulation also has applications in repair and modification of nanostructures built by other means. High throughput SPM manipulation may be achieved by using multitip arrays. Experimental results are presented which show that interactive SPM manipulation can be used to accurately and reliably position molecular-sized components. These can then be linked by chemical or physical means to form subassemblies, which in turn can be further manipulated. Applications in building wires, single-electron transistors and nanowaveguides are presented.

This presentation will also discuss the use of ultrasonic sensors- which can act as a transducer i.e can act as the receiver and transmitter device as well as controlling the device as per the necessary pin configuration given below, which when connected with an atmel micro-controller can do a lot of stuff simultaneously like detecting, ranging, sensing, manipulating with the help of mathematical modeling, etc. this could possibly replace the sonar technology and also could prove of a big use in medicine. The only disadvantage being the cost worthy of it. But then it is going to be our proposal for the technology that could be the next 'small' to replace the 'big'.

Using this concept I have made an autonomous bot that has specially designed control and ultrasonic sensors all of them working on the principle of nanoelectronic devices. To give as an experimental proof I have sent a video of its working and even the sensor pin configuration and the coding part can be easily explained if given an opportunity to explain(we have to use simple c++ language to code it to haxa notation)

Also the use of biomotors would take care of the renew ability of the product and hence it is very user-friendly. Basically it's a proposal and working encompassing most of the process.