

Forth in Education

Spreading the word

<http://www.hidecs.co.uk/>

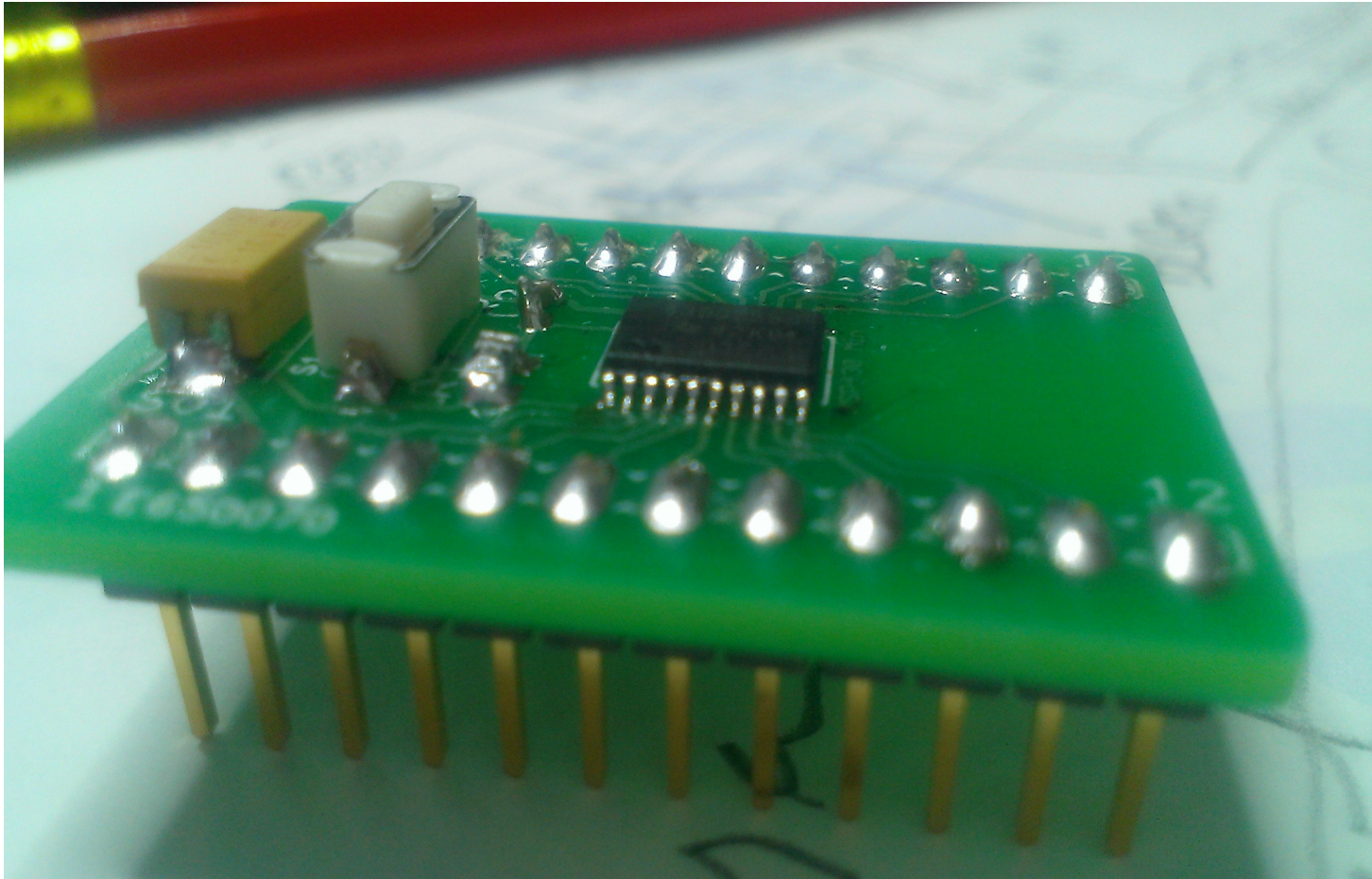
Email: Paul_E.Bennett@topmail.co.uk



Aims

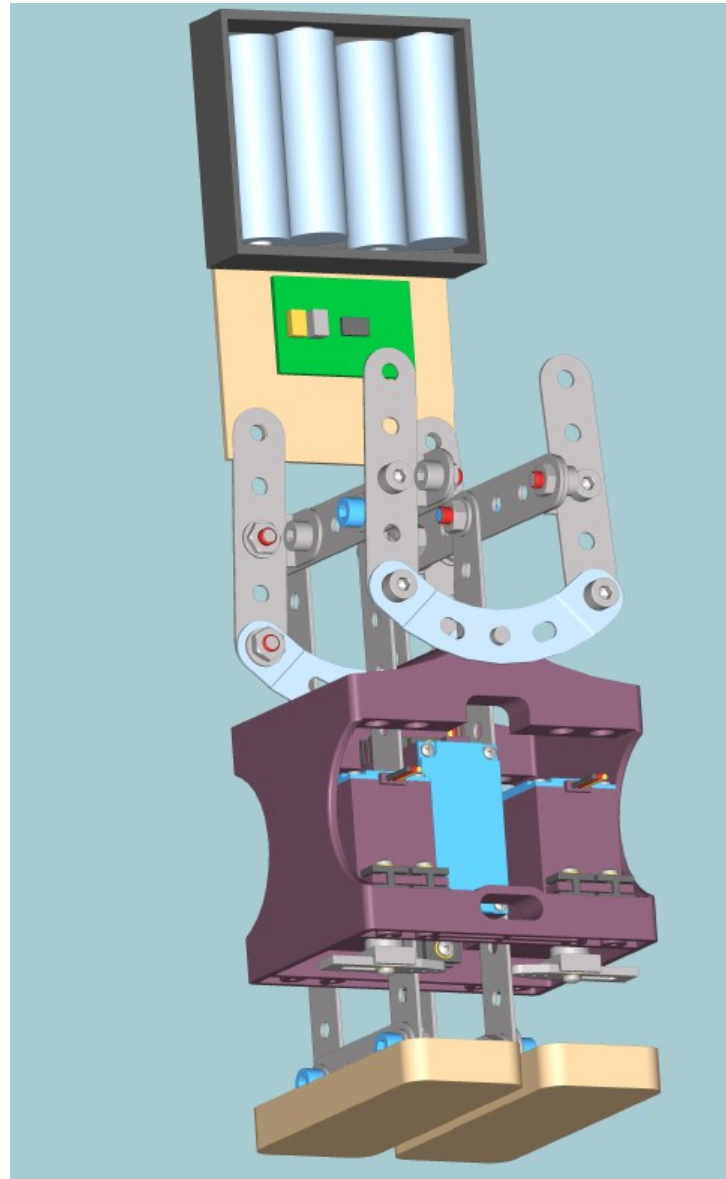
- To get Forth known in every school and college
- To Enable students to explore more involved areas of science and technology
- To unleash imagination

Some tools



MSP430-Min 24 Pin DIL board with MPE's MSP430VfX-Lite installed.

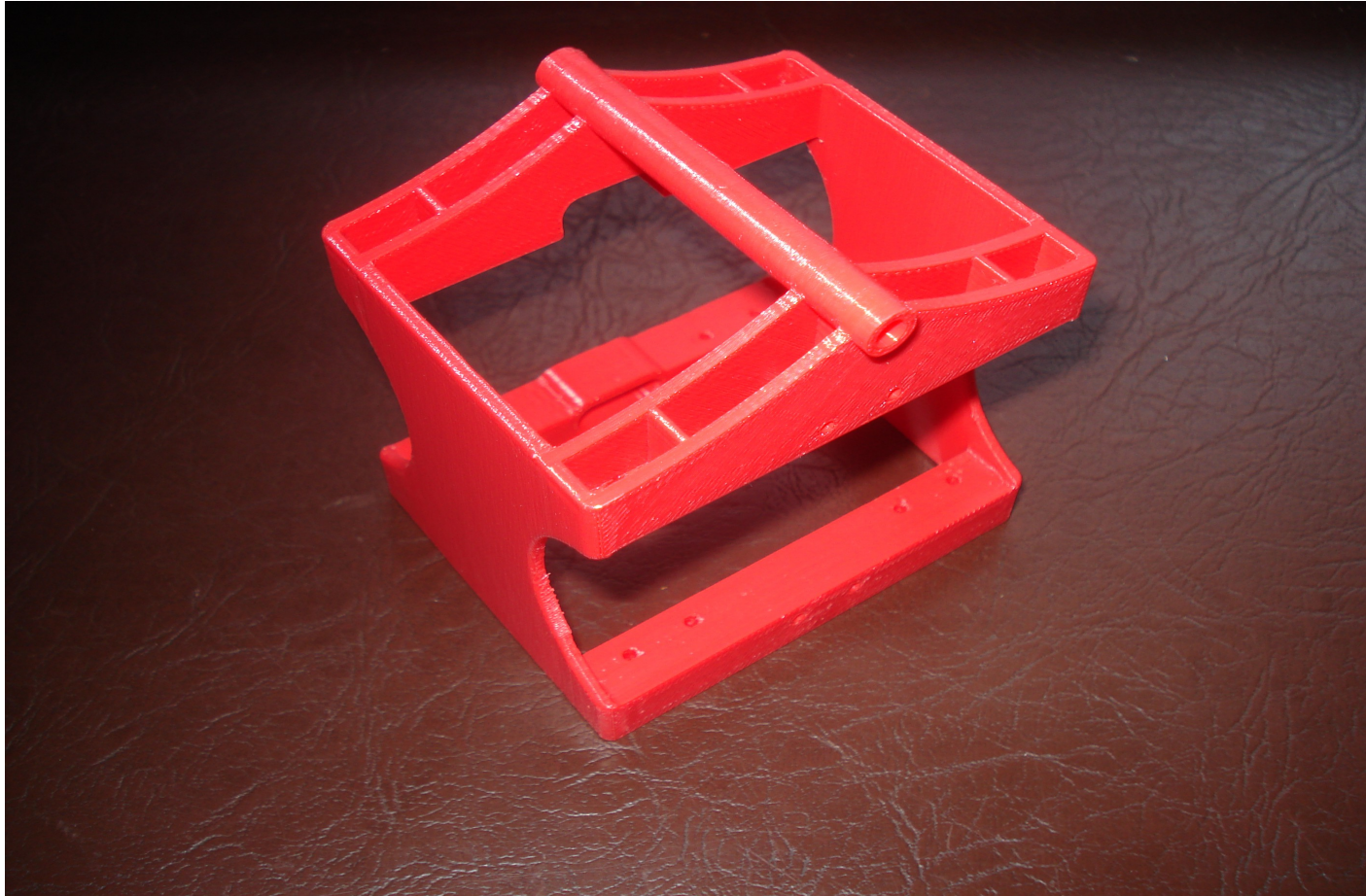
Some CAD



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Some 3D Printing



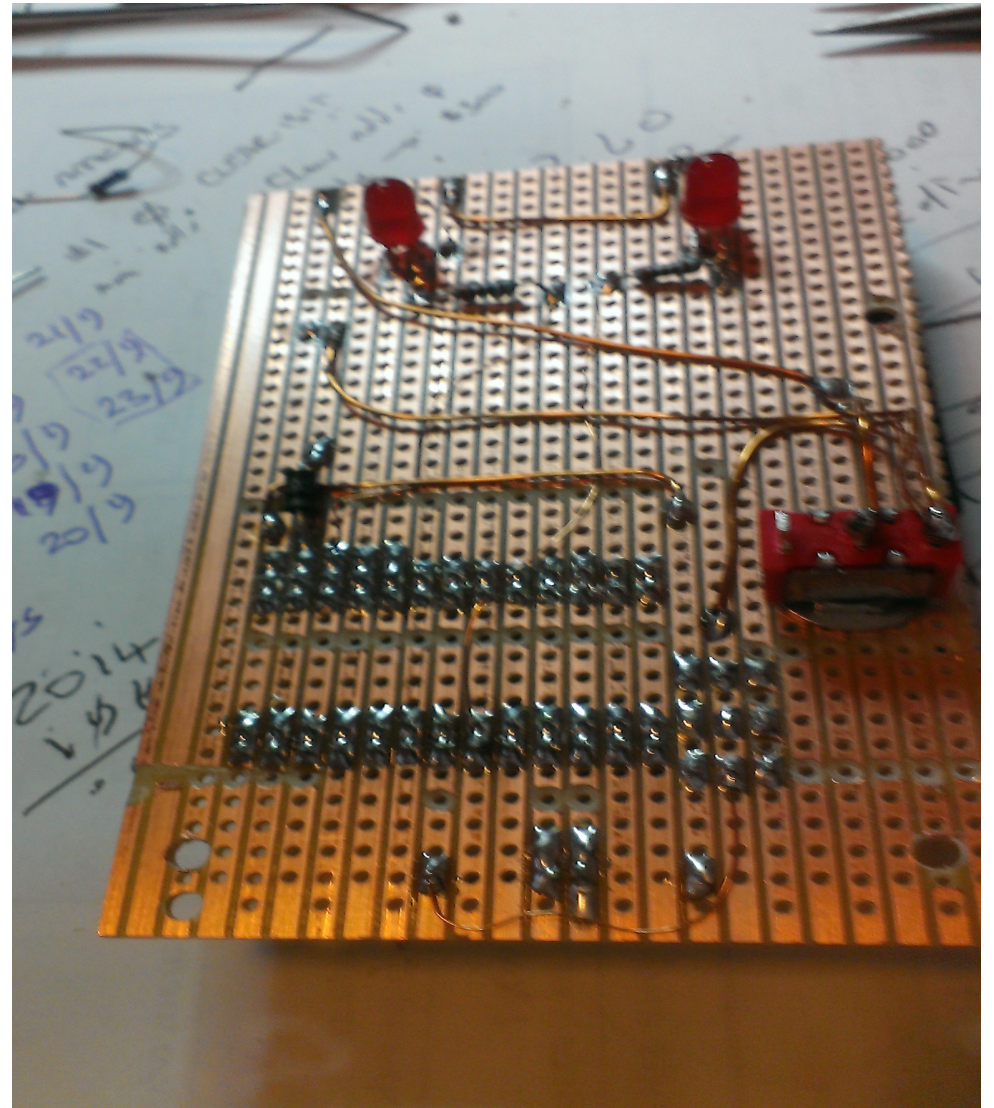
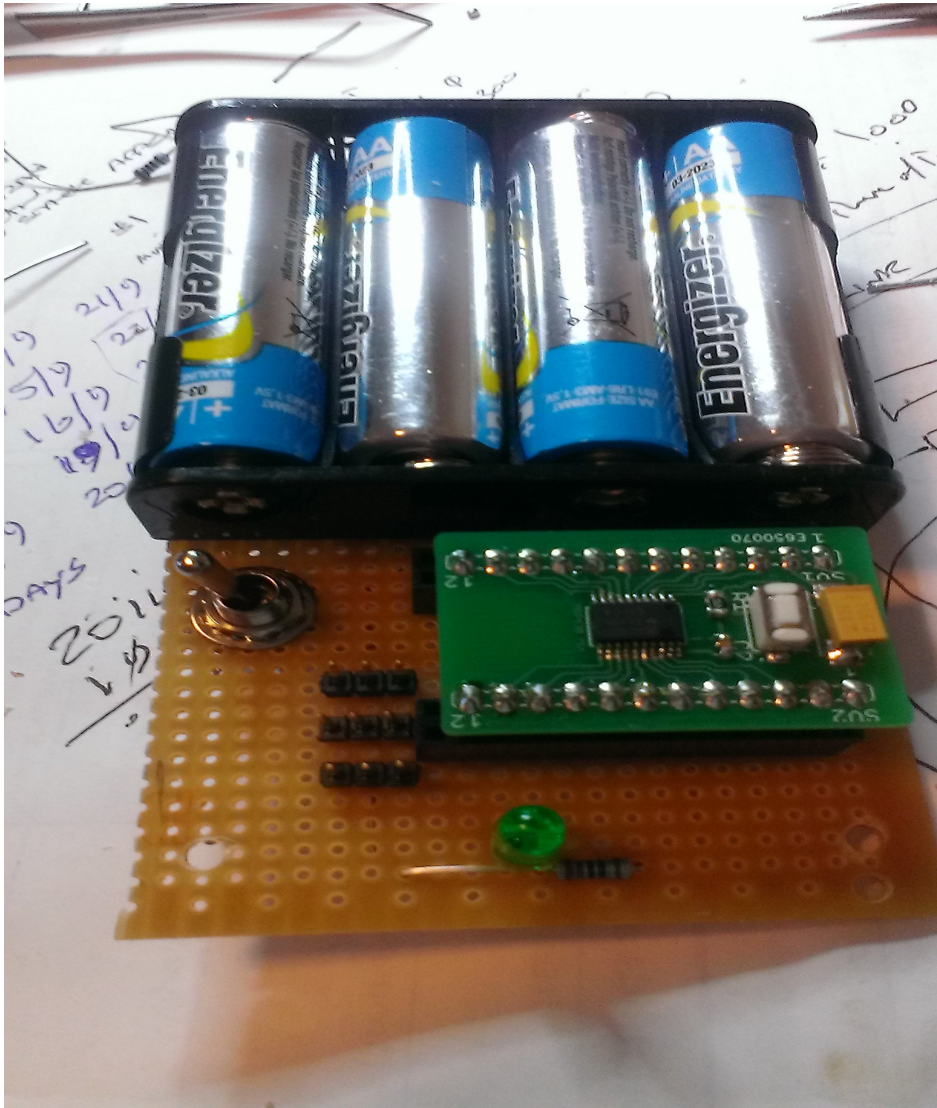
Some Mechanical Assembly



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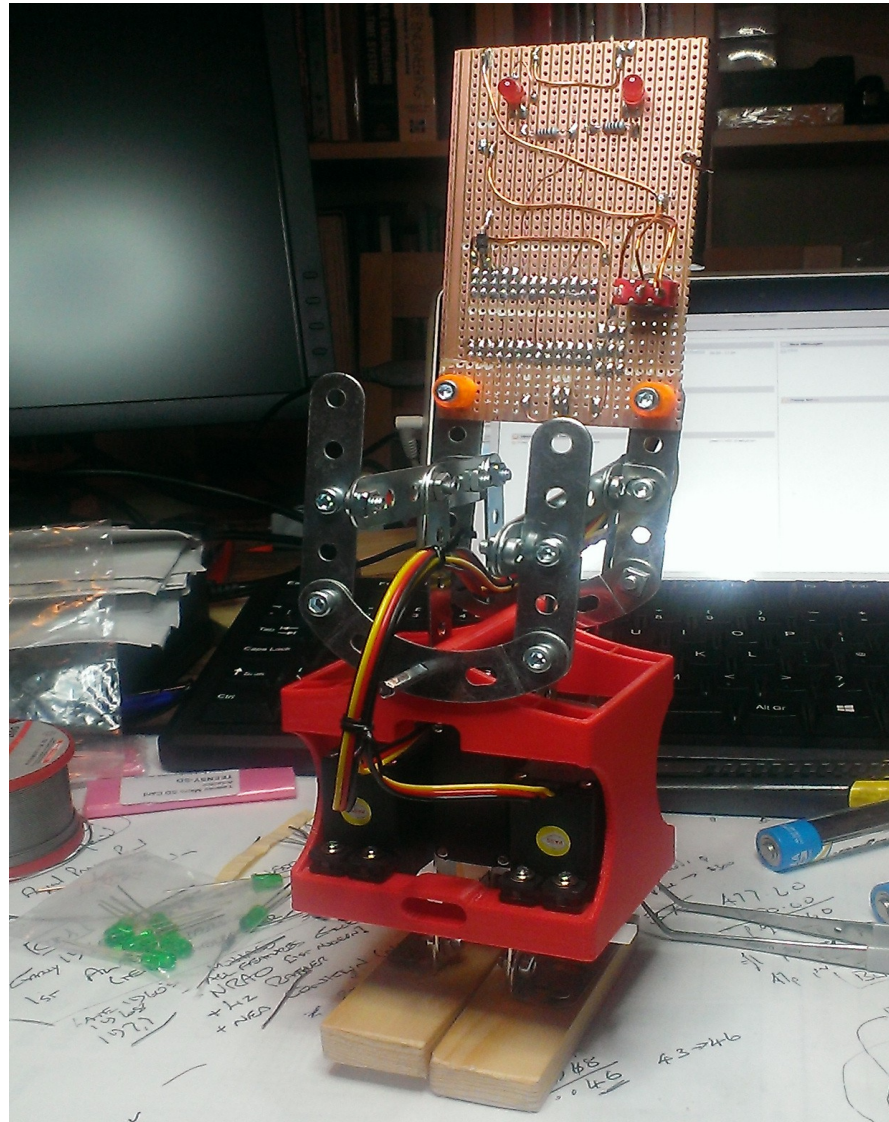
Some Electronic Assembly



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...and about 50 lines of Forth later we have a Walking Robot



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Hip Motion

```
: (DDA)      \ S: x\y -- 'x\'y
\ G: Starting with a value for x and y, calculate
\   the next step values 'x and 'y (Sine and
\   Cosine respectively) using the DDA algorithm
\   as published in several papers on the topic
\   [references included].
  TUCK OVER      \ y\x\y\x
  256 / - -ROT   \ 'y\'y\x
  SWAP 256 / + SWAP \ 'x\'y
;
```

Starting seed x=0 y=32768 (Maxneg on 16-bit)

PWM to Servos

```
: PWM \ "<spaces> name"  
\ G: Create an active array with the identity of "name" in  
\ which is reserved two cells of data space. Each pass  
\ through "name" shall decrement the second cell and return  
\ a TRUE flag. If the second cell reaches zero the returned  
\ flag shall be FALSE, the second cell is reloaded with the  
\ value contained in the first cell during a PWM-RESET that  
\ is aware of the storage structure. The first cell is the  
\ desired value of delay for the channel.  
  CREATE 0 , 0 , \ S: " spaces name"  
  DOES> DUP CELL+ @ ?DUP \ S: -- flag  
  IF 1- SWAP CELL+ ! TRUE  
  ELSE DROP FALSE  
  THEN  
;
```

PWM to Servos

Setting up the Servos

PWM Left-Leg

PWM Right-Leg

PWM Hip

\ Then to centre all servos

\$80 ' Left-Leg PWM!

\$80 ' Right-Leg PWM!

\$80 ' Hip PWM!

That is but one example....

- My target so far has been the Schools and Colleges that teach the theory and practices in all STEM subjects (UTC's, Technical Secondary Schools, 6th Form colleges and beyond).
- A web-site is to be created where this and other ideas will be published to help others get started with projects that excite them. A forum will also be run where signed up members can post their questions and help answer others.