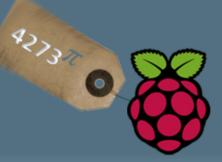


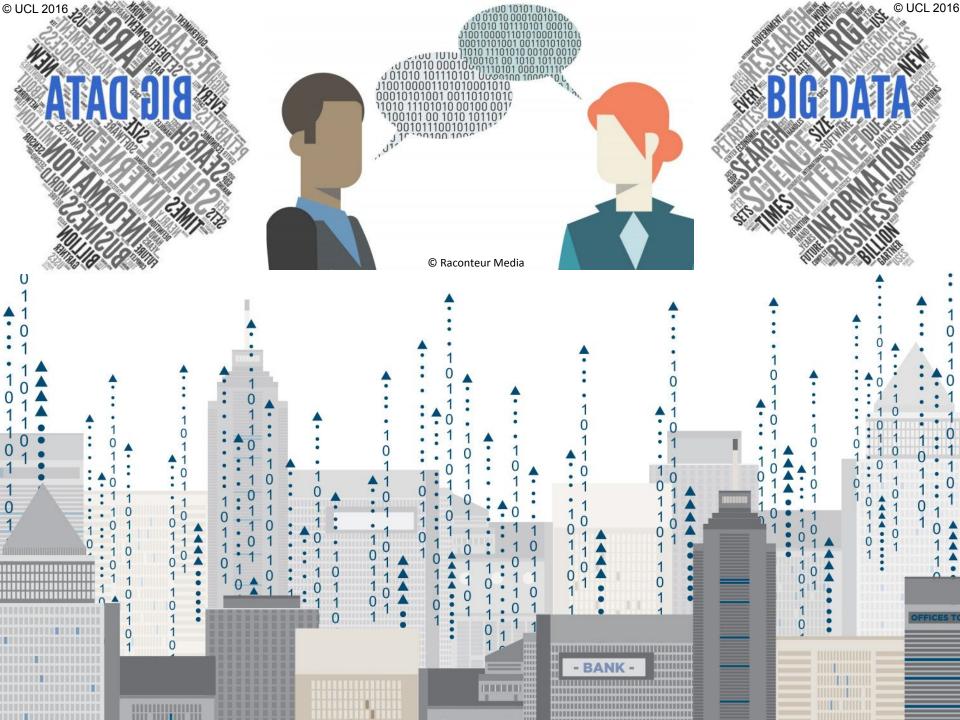
# THE UNIVERSITY of EDINBURGH School of Biological Sciences



## **Doing bioinformatics on the Raspberry Pi**

Heleen Plaisier Daniel Barker

@4273pi http://4273pi.org



© datafloq.com

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http://www.promegaconnections.com/massively-parallel-sequencing-for-forensic-dna-analysis/#more-23598

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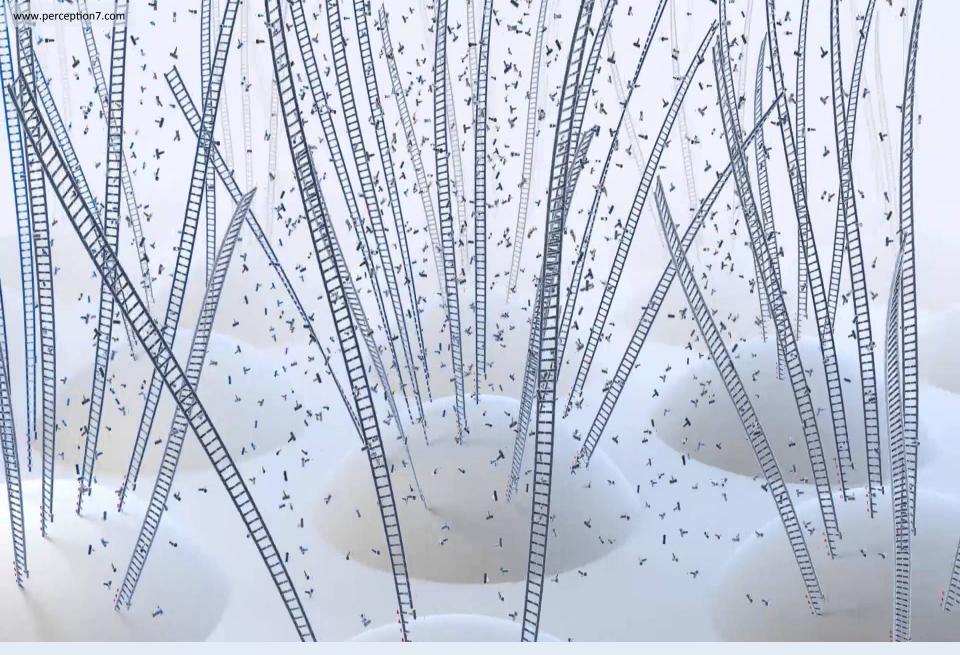
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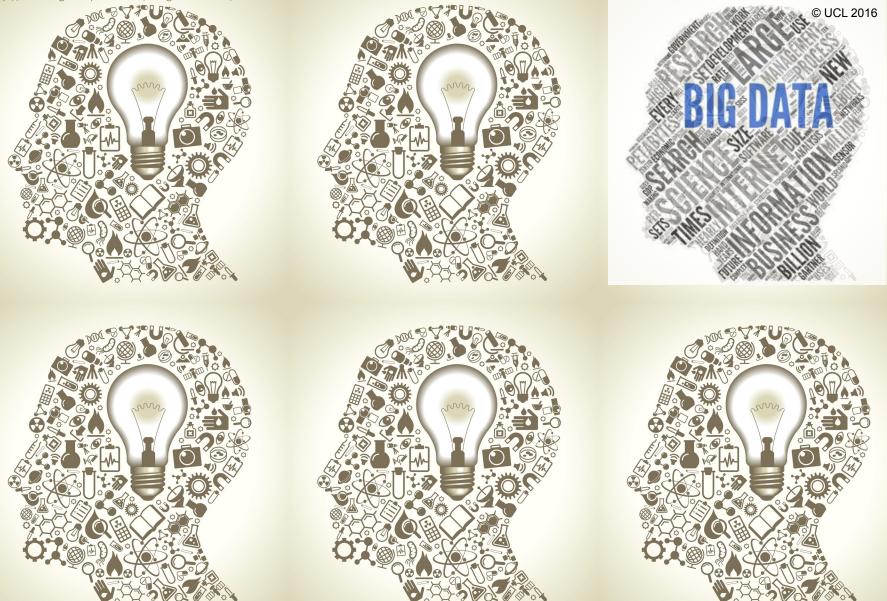
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bioinformatics helps biologists find needles within genomic haystacks

http://www.bigstockphoto.com/image-42730474, © VLADGRIN



### bioinformatics turns data into knowledge

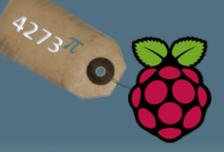




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# 4273π

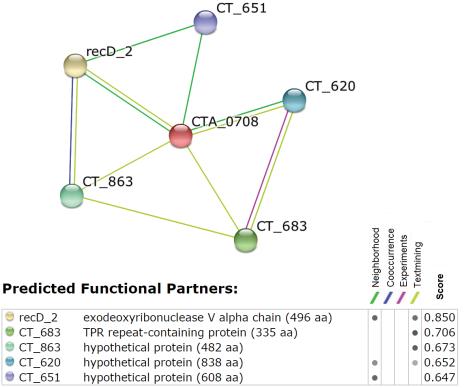
# Freely available materials for teaching and learning bioinformatics on the Raspberry Pi



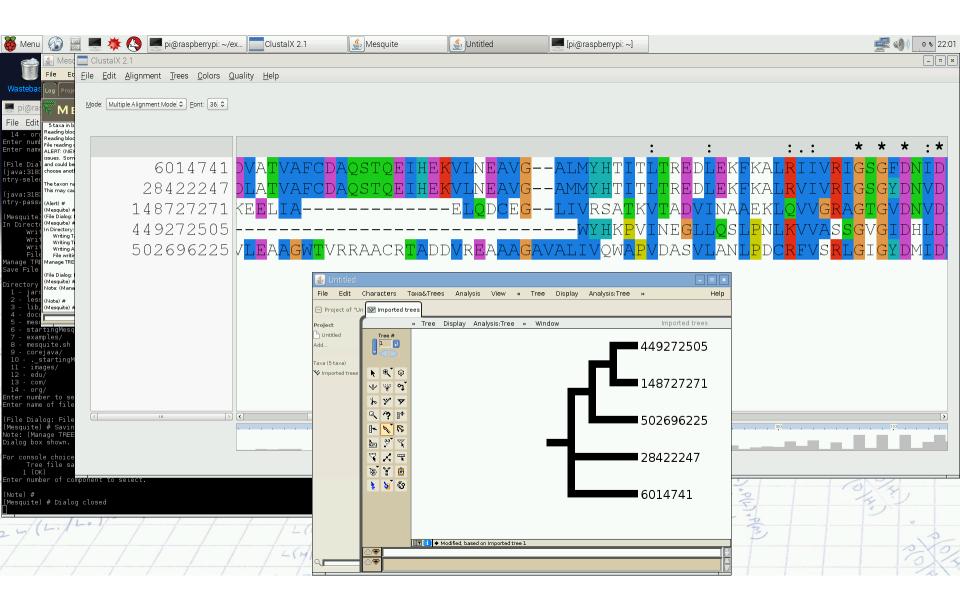
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pc0752 pc0010 Predicted Functional Partners:		Textmining	Score				
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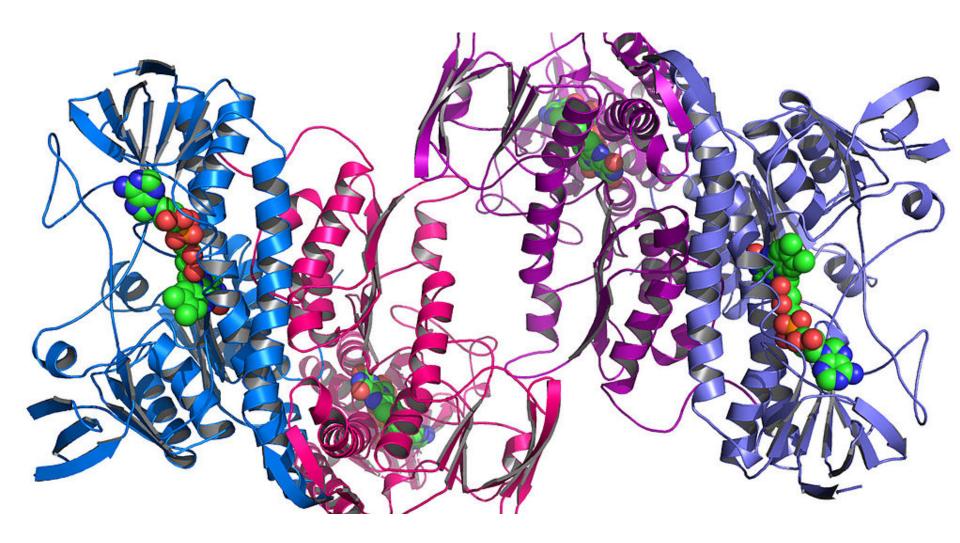
Robson J, Barker D. Comparison of the protein-coding gene content of *Chlamydia trachomatis* and *Protochlamydia amoebophila* using a Raspberry Pi computer. *BMC Research Notes* 8:561.



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[ \$Frame = \$stack ]&&
act=\$stack0 && imact=\$master0 !! { act=\$master0; imact=\$stack0; }
; set\_wars H do all that stuff I just said 1 (T tell yes note 'percent sector and 'percent sector 'percent 'percent's 'percent 'percent's key (ACO3) ( [ semicolon, colon, key (ACO3) ( [ semicolon, colon, key (ACO3) ( [ semicolon, colon)] thorn 12; AC 121 uzoze ; dome herbstclint chin : \ scf frae\_gap "-5gap", scf frae\_gap "-5gap", scf frae\_gap "-5gap", scf frae\_gap "-5gap", scf frae\_gap (-5gap), scf frae\_gap (-5g "hobrew node toggie function! ToggteRebrew() if %irightleft == 0 | set rightleft Keymap=hebrew else | set norightleft Keymap= | endif endfunction (create bindings for insert and normal mode together) HH Functions called by the loser (uo() { HHM samp out of the current frame into the other. if C -m 'Startyghl' ], then H sprintlis null if I frame will chn bith - Start H may client to inact frame. [ 'Startyghlanct' ]= / ] & chn cycle -1, shift e Sact , focus -e Sinact , cycle ] key (4801) ( C key (4803) ( C key (4803) ( C key (4803) ( C key (4805) ( C key (4805) ( C key (4807) ( C key (4807) ( C key (4803) ( C key (4810) ( C dead\_codilla 1 dead\_ogonek 1 Codilla 1 U2240. 290 ulto7, ntilde brouse "sp" "create bindings for insert and normal mode to function! Dualbind(key.command) exe "noremap (Leader)" a:key a:command exe "inoremap (Leader)" a:key ""0" a:command endfunction Else in dien Frankf spill i vers (Felse + Sinaff, cycle 1 he spill Spill direction Spill vers (Line) in direction frank, als Stack Lagent I "Spill direction" = Parkantal V Softman Andre - r II chn shift -i C Felse - Spield, sell augus Stack \_ Spill I C Felse - Spield, sell augus Stack \_ Spill I C Felse - Spill Sechn Felse = spissterb poriod, greater, slash, question, dead macron , are quertiendown Found=( \$(Find -L + -type d -name "\$1") ) cdlist esac done& koy (SPCE) & C space, space. let mapleader=";" H switch to different layouts directly 5 hc keybind \$Nod-Alt-v set\_layout vertical h c keybind \$Nod-Alt-h set\_layout horizontal h c keybind \$Nod-Alt-s set\_layout nata hc keybind \$Nod-Alt-g set\_layout grid include "level3(ralt\_rwitch) actions morreap citcht/(teader/sy\_call TogsteSyntax()(GB) call builting ('1', 'scall TogsteHenrew()(GP)') lat actions = [['A', 'scall TogsteHendeindent'], ['tw', 'tw=72'], ['W for [ key, satting ] in sattings mod 'call builting('', key, '', satt' acting, '(Cr)')' | endfor 12 m tack\_spawn() { HHH spawn applications in the stack.
["Staptydlu" = ")" ] && \$0 || H just spawn if no other clients exist.
if [ -z "Staptydlu" ]; then \$0; auto; else hc focus -e \$stack0; \$0; Tasks: 66, 45 thr: 1 running Load average: 0.09 0.11 0.16 Uptime: 10:47:05 dist() {
 if \${\$\$\$ cound} -gt 1 ],then
 for ((i=1, i <= \${\$\$\$ cound\$-j1}, i++)),do
 con "\${\$\$}, \${\$\$ ound\$\$ j1}"
 done
 coh o -n "which? "
 read st1
 builtin cd "\${found{\$\$e1}}"
</pre> ster\_spawn() { HHH spawn applications in the master. if [ "\$EmptyAll" = ")" ] nc keybind \$Mod-semicolon spawn \$conf/swap auto nc keybind \$Mod-slash spawn \$conf/swap close " saving and quitting
For key in ['w', 'q', 'x']
 exe "call Dualbind("".key."', ':".key."KCR>')" | endFor re som start - / μ ter θ anges 1 be clients in matter out and then spawn ter e "StarbyAll" ] 66 auto white ["SpawhyAtter" is '/ ], do http://sous-e SmasterD.shift -e SplackO., Focus -e SmasterD.set \_dome."30" NER I Supi PESTEPEN N1 "Filetypes for [ key, ft ] in [['a', 'asciidoc'], ['p', 'python'], ['s', 'sh exe "noremap <Leader>f", key " :set filetypes".ft "<CR>"lendfor Playlist (& items, length: 35 minutes, 25 seconds) hcstgbind \$And-Control-h resize teft +\$RESIZESTEP hc keybind \$And-Control-j resize down +\$RESIZESTEP hc keybind \$And-Control-k resize up +\$RESIZESTEP hc keybind \$And-Control-k resize right +\$RESIZESTEP search as Volume: 35 Time Artist Title/Filename Album builtin od "senund" exit 0 ;; \*) OPENS " Window Hanagement for key in [ "h", "j", "k", "l", "H", "J", "K", "L" ] exe "call Dualbind" "", key, "f, ""H", key, "f )" | endfor 4:36 Christina Perri Penguin Lovestrong [Deluxe Edition] esac " get ya some output From shell commands nnoremap (Leader>Sh :15hCR) vnoremap (Leader>Sh divo(Ssc)p.!shCR>Udd`vPjdd`v nnoremap (Leader>py :1python(CR> vnoremap (Leader>py :1python(CR> () [ sentymest\_vars [ sentymester = ')' ] && hec , focus -e \$stack0 , shift -e \$master0601 [ sentymester = ')' ] && hec , focus -e \$stack0 , remove Playing: Christina Perri "Lovestrong [Deluxe Edition]" (2011) - Pengui [0:30/4:36] bind --all Uptume statung- (cui) - regun dis incr Lines ad. M HELDARA (cui) HELDARA (cui) HELDARA (cui) HELDARA (cui) HELDARA hc Rousebind \$Rod-Button1 Rove hc Rousebind \$Rod-Button2 zoom hc Rousebind \$Rod-Button3 resi [ -2 "\$17 ] 66 fbset -9 1600 900 1600 900 32 11 fbset -9 "\$17 or W aliased to 'brws', so W US if [[ \$0 = \*brws ]]; 6 then sel="\$PWO" & browse 7 else search fi Diexit # do something and exit " pasting vnoremap <Leader>c "\*y inoremap <Leader>v ^0"\*P call Dualbind( 'P', "\*p" inoremap <Leader>p ^0p delfunction Dualbind 111 Force 112 The Regular State-JackSpace Cycle and In-123 The Regular State-JackSpace Cycle and In-124 The Regular State-Space Cycle and In-125 The Regular State-Cycle In-126 The Regular State-Cycle In-126 The Regular State-Cycle In-126 The Regular State-Cycle In-127 The Regular State-Cycle In-128 The Regular S H opens a twox session with an optional ( tm() { twox new-session "\$0" ;} esit Hdl() { dict "\$\*"|vimpager; clear ;} HH looks up a word using remote dictionaries Hdr() { dict -h dict nro "\*\*"|vimpager; clear; } whttp://www.desktopimages.org OWS ROUSE

2013-02-21, 20:31

1 2 3 😤



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4273π offers free loanboxes for Scottish state schools

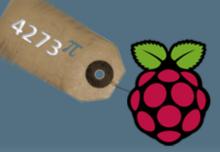
one loanbox contains

10x Raspberry Pi 2 B 10x USB power adaptor 10x USB to micro USB cable 10x VGA to HDMI adaptor 10x VGA cable 10x Rii keyboard 10x Pi-Hut 7 USB hub (extension cords)

10x ready to use 32GB Micro SD card preloaded with 4273π customized distribution of Raspbian GNU/Linux, bioinformatics teaching materials, software and data



# http://4273pi.org



- Download SD card image
- Request loan box
- Request demonstrations, school events
- Report bugs, make suggestions
- Links to social media
- Stay in touch

### Acknowledgements: $4273\pi$ project

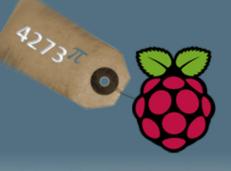
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http://www.yourgenome.org/stories/scaling-up-for-the-human-genome-project



Oxford Nanopore, https://vimeo.com/127689863