

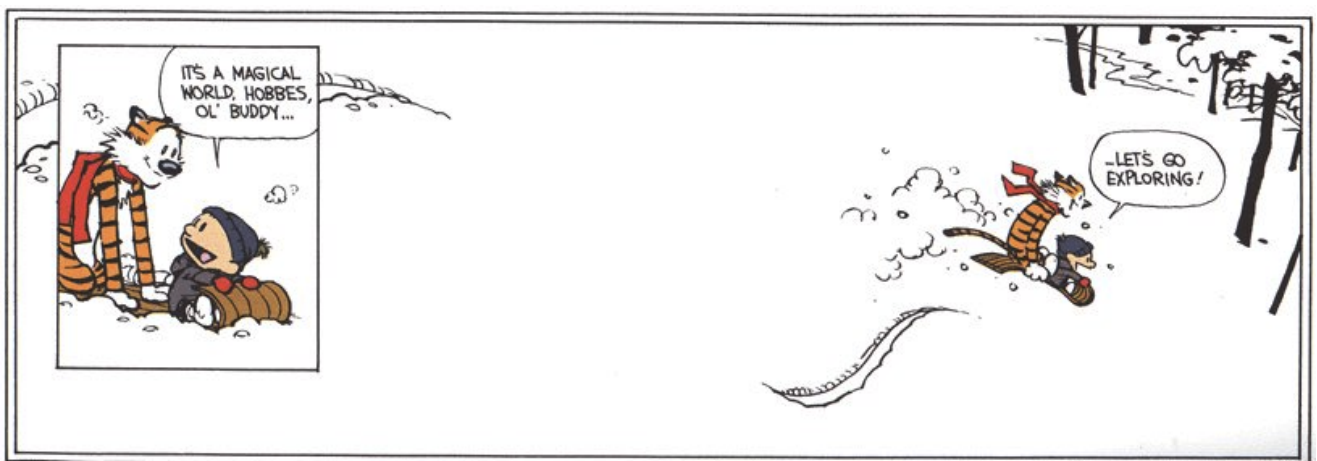
# Title Author\*

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Exciting catch phrase!

# Alternative Title

Author | Subtitle

# Thanks

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To someone.

Began: July 16, 2012  
Updated: April 4, 2013

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# Part I

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# Intro Examples

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## El mundo real

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## Lists

Example of making list automated, saving space and reducing errors.

## Terms

<b>endocrine chemicals</b> <ul style="list-style-type: none"><li>• proteins</li><li>• steroid hormones</li><li>• amine hormones</li><li>• testosterone</li><li>• insulin</li><li>• thyroxine</li><li>• epinephrine</li><li>• tropic hormones</li><li>• thyrotropin</li><li>• luteinizing hormone</li><li>• follicle-stimulating</li></ul>	<b>chemicals</b> <ul style="list-style-type: none"><li>• hormone<ul style="list-style-type: none"><li>• corticotropin</li><li>• growth hormone</li><li>• prolactin</li><li>• melanocyte-stimulating hormone</li><li>• enkephalins</li><li>• endorphins</li><li>• POMC</li></ul></li><li>• <b>receptor tyrosine kinases</b><ul style="list-style-type: none"><li>• dimerization</li></ul></li></ul>	<ul style="list-style-type: none"><li>• autophosphorylation</li><li>• SH2 domains</li><li>• EGFR</li><li>• Ras</li><li>• Raf</li><li>• MEK</li><li>• ERK</li><li>• SOS</li><li>• Sevenless</li><li>• Drk/Grb2</li><li>• Ras-GAP</li><li>• Ras-GEF</li><li>• cAMP</li></ul>	<ul style="list-style-type: none"><li>• signal amplification</li><li>• cGMP</li><li>• guanylyl cyclase</li><li>• phospholipids</li><li>• calmodulin</li><li>• protein-tyrosine phosphatase</li><li>• serine/threonine kinase</li><li>• intracellular signal transduction</li><li>• NF-<math>\kappa</math>B</li><li>• I<math>\kappa</math>B</li></ul>
---	--	--	--

## R

See proposed hierarchical neural networks pseudo-code block at end of paper for example implementation of this method in the R statistical language ([Code 1](#))—error handling and background of creation of some parts of the neural networks are left out for sake of clarity.

### **Code 1: hierarchical neural networks in R**

---

```
# Load neural net library
library(nnet)
library(neuralnet)

# Load trained neural nets
source("model.training.NN.hierarchical.v1")
trainedNeuralNets = NNtrained()

# Load data
source("data.run.NN.hierarchical")
this.data = NNdata()

# define the number of loops before an error has occurred
error.loop.value = 3

neuralNet <- function(neuralNetFxn, this.loop.input){
  # this function runs specific level of a hierarchal neural network then
  # recursively calls the next layer
  # base case is defined when a parent neural net has no children

  # run the initial neural net on the input
  # classifications is a tuple of probabilities for being in given class
  list(classifications,subfunctions) := neuralNetFxn(this.loop.input)

  # set the threshold
  threshold = this.loop.threshold.value

  # get index of next neural net function to be called
  subidx = max(find.col(classifications>threshold))
```

---

## Python

A playlist maker for python ([Code 2](#)), see more concise implementation in bash ([Code 3](#)).

### **Code 2: python playlist maker**

---

```
#!/Python27/env python
#Biafra Ahanonu
#2012.12.02

#Makes .m3u extended playlist at first level folders in a directory

#Modules used
import os,re,time
#Import settings from settings.py
from settings import *
#Help filter out duplicates
from sets import Set

def folderBrowser():
    #Opens a folder
    import Tkinter, tkFileDialog
    root = Tkinter.Tk()
    root.withdraw()
    dir =
        tkFileDialog.askdirectory(parent=root,initialdir=DEFAULT_DIR,title='Please
            select a directory')
    return dir

def fileTree(dir,relDir):
    #Crawls through a directory and finds audio files, returns list of files
    print dir

    #Variable to save files to
    filesToSave = []

    #Valid mp3 files
    validFiles = set(VALID_AUDIO_FORMATS)
```

---

## bash

Improved playlist maker implemented in bash ([Code 3](#)).

### Code 3: bash playlist maker

---

```
#!/bin/bash
# biafra ahanonu
# 2013.02.23
# script to make playlists

# Yes/No function
getYesNo(){
    select terminateSignal in "Yes" "No"
```

---

```
do
    case $terminateSignal in
        "Yes" )
            return 1;;
        "No" )
            return 0;;
    esac
done

}

# Change file separator to allow use of files with spaces
oldIFS=$IFS
IFS=$(echo -en "\n\b")

# Ask user for directory
echo "Directory? "
read userDir
echo $userDir
cd $userDir

# Ask to remove old .m3u files
echo "Remove old .m3u files? "
```

---

## FASTA

Example use of the fasta formatting for protein sequences.

### FASTA sequences

D<sub>1</sub>a dopamine receptor | Homo sapiens | Humans

```
MRTLNTSAMDGTLVVERDFSVRLTACFLSLILSTLLGNTLVCAAVIRFRHURSKVTNFFVISLAVSDLLVAVLVMPPWKAVAEIAGFWPFGSFCNIWVAFDIMCSTASILNLCVISVDRYWAISSPFRYERKMTPKAAFILI  
SVAWTLISVLSFIPVQLSWHKAKPTSPSDGNATSLAETIDNCDSSLSRTYAISSSVISFYIPVAIMIVTYTRIYRIAGKQIRRIAALERA AVHAKNCQTTTGNGKPVCECSQPESSEFKMSFKRETKVLKTLNVIMGVFVCCWL  
PFFILNCILPFCGSGETQPFCDISNTFDVFVWFGWANSSLNPIYAFNADFRKAFSTLLGCYRLCPATNNAIETVSINNINGAAMFSSHHEPRGSISKECNLYYLIPHAVGSSDLKKEEAAGIARPLEKLSPALSVILDYD  
TDVLSLEKIQPITQNGQHPT
```

## Problems

If there is any confusion about the questions, shoot me an email or talk to me after class.

1. Look at **??**, why is the heart rate of the iguana different at the same temperature? In the first case the body temperature is decreasing while in the second case the iguana raises its heart rate to increase blood flow, which leads to increased body temperature.
2. How does increasing heart rate while in direct sunlight help warm the body? More blood can flow to the skin and be warmed.
3. What does it mean for the Q10 of the metabolic rate of an animal to be 2? To be 1? the animal consumes half as much oxygen per hour at 20C as it does at 30C. In the case of 1, it doesn't change.

## Equations

Example of several equations chosen at random from different works. Illustrates the use of the **lbpeq** macro.

$$E = \frac{1}{2} \sum_{q=1}^n \sum_{k=1}^K [y_k(x^q, w) - t_k^q]^2 \tag{1}$$

$$y_j(x) = \sum_{i=0}^n w_{i,j} \phi(x)_i \tag{2}$$

$$\phi(x)_i = \exp(-\frac{x - \mu_i^2}{2\omega_i^2}) \tag{3}$$

$$M + Q_{abs} = \epsilon \sigma T_r^4 + h_c(T_r - T_a) + E + C \tag{4}$$

**End of Preview**

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# Appendix

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Additional figures and tables are included. References and index found at the end.

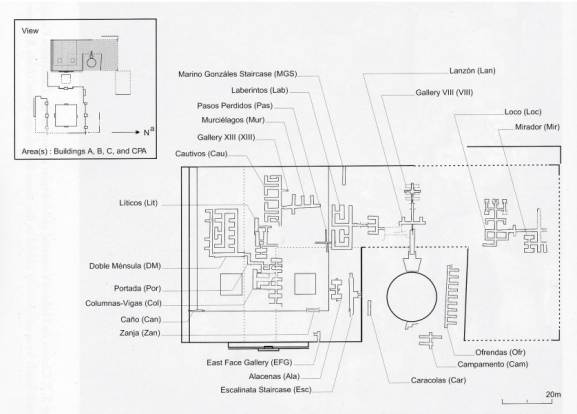
Name	Type	%Δ	Onset	Localization
YAP	protein	60	E18	Nuclear->Cytoplasm
Hippo	protein	40	E18	Cytoplasm
agmatine	metabolite	20	?	Ex->Cytoplasm
Lim1	protein	-50	E9.5	Cytoplasm
FoxC1/2	protein	-10	E11.5	Cytoplasm

**Table 1 | Hypothetical list of kidney proteins and metabolites** These were identified after removal of housekeeping and injury genes. %Δ is protein or metabolite level change from **onset** to cessation of kidney growth. Onset time is part hypothetical, part from the literature.

# Figures



(a) fig



(b) fig



(c) fig

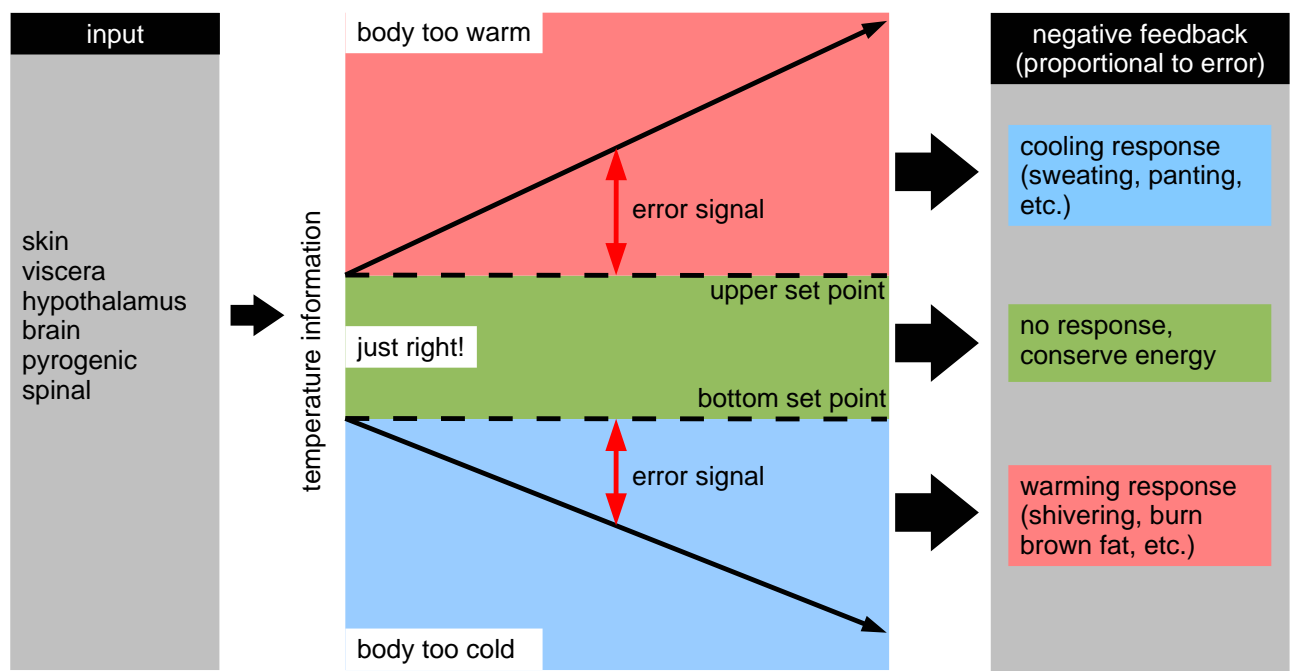


(d) fig

## Figure 2 | Native Americans

(a) Pueblo Bonito was an.... (b) Located in Peru. (c) The different type of game hunted in the Americas. (d) The cenote, which were seen as sacred by the Maya.





**Figure 4 | Response regulation**

General concept of integrating temperature information and formulating a response.

# References

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