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Alternative Title

Author | Subtitle

Thanks

To someone.

Began: July 16, 2012
Updated: April 30, 2013

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Part I

Intro Examples

El mundo real

Lorem ipsum dolor sit amet (Table 1), consectetur adipiscing elit.[5] Integer ut arcu risus. Etiam tincidunt aliquet quam nec dignissim (Figure 2). Nam commodo nibh in dui volutpat molestie. Praesent elit dolor, congue in molestie id, ultricies quis leo. Nulla libero dolor, lacinia in vestibulum vestibulum, sagittis ut turpis. Quisque laoreet nisi ut nulla congue ut rhoncus mi imperdiet. Etiam bibendum mauris eget purus laoreet egestas.[2] Vivamus eget justo nec augue facilisis scelerisque. Aenean sit amet quam eget odio aliquet rutrum. Cras gravida, risus id volutpat vehicula, risus nibh malesuada nisi, at suscipit lorem sem eu est. Aenean sit amet arcu sed augue pulvinar aliquet in non urna. Donec tincidunt vehicula est at accumsan. Integer purus lacus, adipiscing eget dictum non, commodo non arcu. Donec adipiscing luctus massa, non placerat sem dignissim vitae. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.[1,9]

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Lists

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

Terms

endocrine chemicals

- proteins
- steroid hormones
- amine hormones
- testosterone
- insulin
- thyroxine
- epinephrine
- tropic hormones
- thyrotropin
- luteinizing hormone
- follicle-stimulating hormone
- corticotropin
- growth hormone
- prolactin
- melanocyte-stimulating hormone
- enkephalins
- endorphins
- POMC

receptor tyrosine kinases

- dimerization
- autophosphorylation
- SH2 domains
- EGFR
- Ras
- Raf
- MEK
- ERK
- SOS
- Sevenless
- Drk/Grb2
- Ras-GAP
- Ras-GEF
- cAMP
- signal amplification
- cGMP
- guanylyl cyclase
- phospholipids
- calmodulin
- protein-tyrosine phosphatase
- serine/threonine kinase
- intracellular signal transduction
- NF-κB
- IκB

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 occured
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_1a dopamine receptor | Homo sapiens | Humans

MRTLNTSAMDGTGLVVERDFSVRILTACFLSLLILSTLLGNTLVCAAVIRFRHLRSKVTNFFVISLAVSDLLVAVLVMPWKAVAEIAGFWPFGSFCNIWVAFDIMCSTASILNLCVISVDRYWAISSPFRYERKMTPKAAFILI
SVAWTLSVLISFIPVQLSWHKAKPTSPSDGNATSLAETIDNCDSSLSRTYAISSSVISFYIPVAIMIVTYTRIYRIAQKQIRRIAALERAAVHAKNCQTTTGNGKPVECSQPESSFKMSFKRETKVLKTLSVIMGVFVCCWL
PFFILNCILPFCGSGETQPFCIDSNTFDVFVWFGWANSSLNPIIYAFNADFRKAFSTLLGCYRLCPATNNAIETVSINNNGAAMFSSHHEPRGSISKECNLVYLIPHAVGSSEDLKKEEAAGIARPLEKLSPALSVILDYD
TDVSLEKIQPITQNGQHPT

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

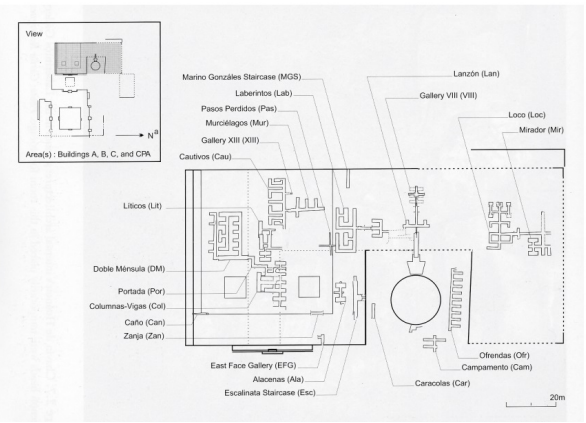
Appendix

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	metaboliote	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.

(a) fig



(b) fig

(c) fig

(d) fig

Figure 1 | 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.

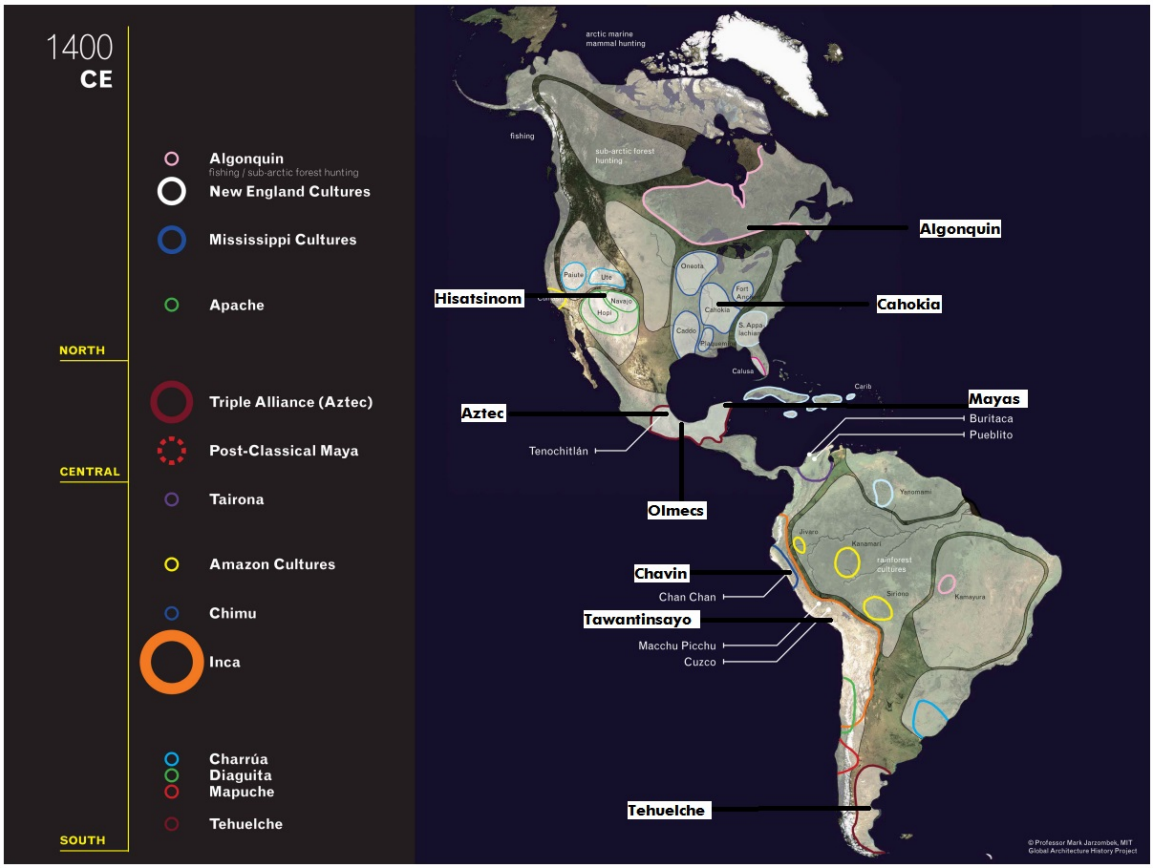


Figure 2 | Map of Civilizations Discussed
Image of the Americas with locations of the cultures discussed in the text. We start with the Algonquin and then discuss the Cahokia, Hisatsinom, Olmec, Maya, Aztec, Chavin, Inca, and Tehuelche.

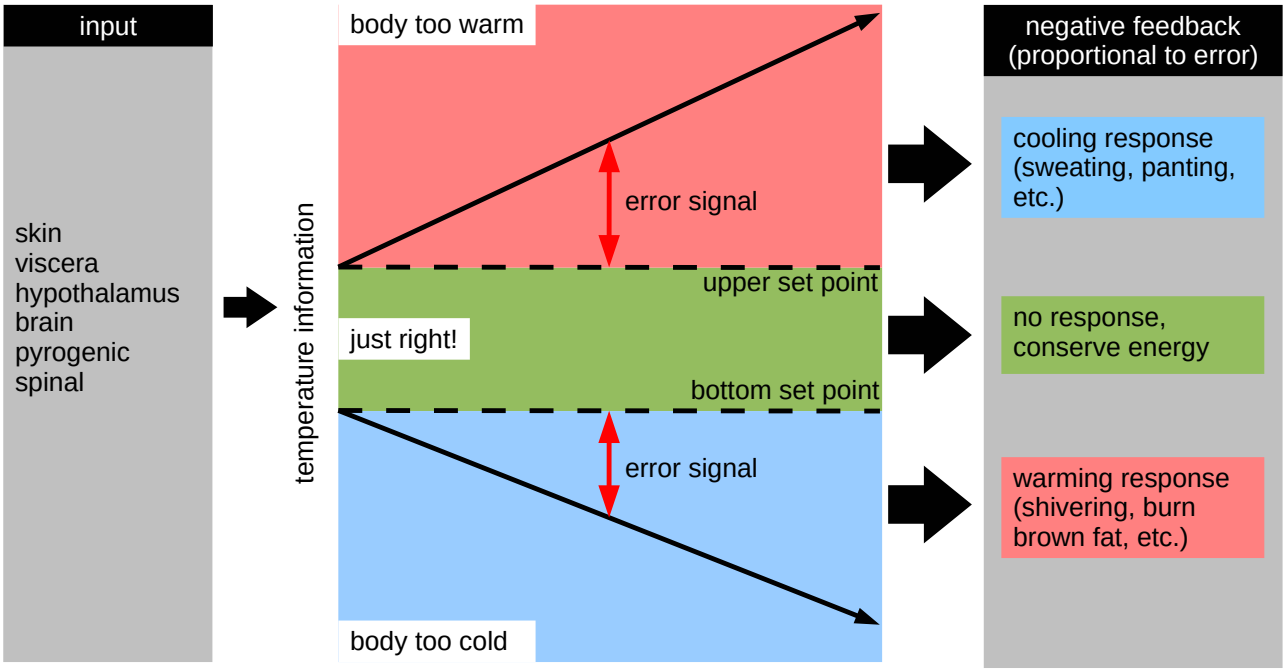


Figure 3 | Response regulation
General concept of integrating temperature information and formulating a response.

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