# Nonparametric Bayesian Methods: Models, Algorithms, and Applications

Tamara Broderick
ITT Career Development Assistant Professor
Electrical Engineering & Computer Science
MIT

# Applications

# Applications

[wikipedia.org]

# Applications

[wikipedia.org]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]

# Applications

[wikipedia.org]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

"Wikipedia phenomenon"

[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

"Wikipedia phenomenon"

[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

[Ed Bowlby, NOAA]

[Sudderth, Jordan 2009]

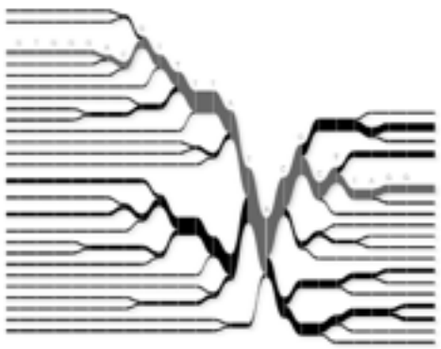
[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Sudderth, Jordan 2009]

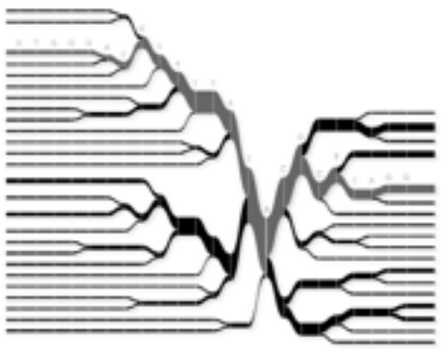
[US CDC PHIL; Futoma, Hariharan, Heller 2017]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

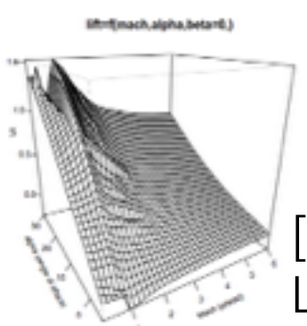
[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]



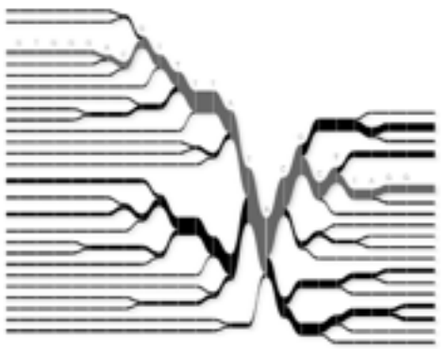
[Gramacy, Lee 2009]

[Chati, Balakrishnan 2017]

# Applications

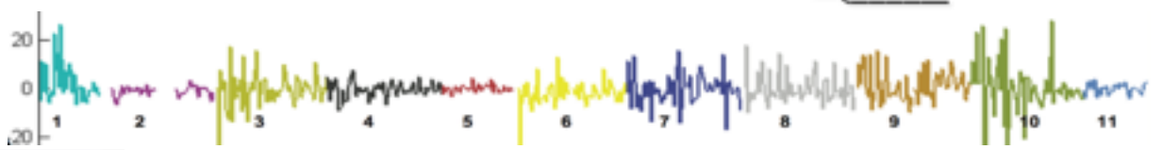
[wikipedia.org]

[Ed Bowlby, NOAA]

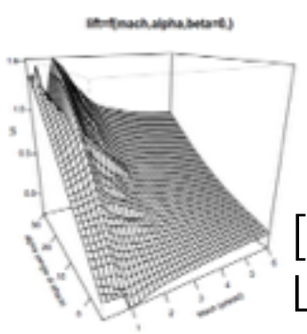


[Ewens 1972; Hartl, Clark 2003]

[Saria et al 2010]



[US CDC PHIL; Futoma, Hariharan, Heller 2017]



[Gramacy, Lee 2009]

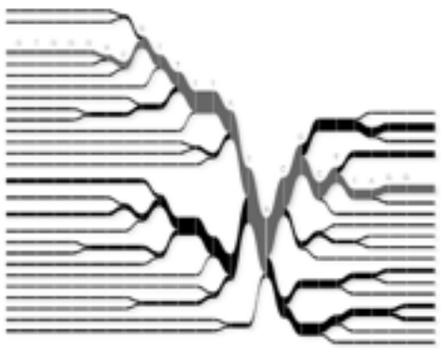
[Chati, Balakrishnan 2017]

[Sudderth, Jordan 2009]

# Applications

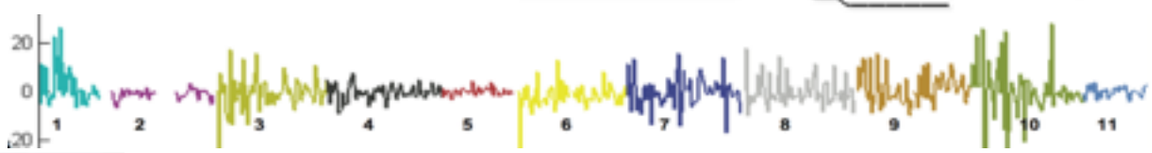
[wikipedia.org]

[Ed Bowlby, NOAA]



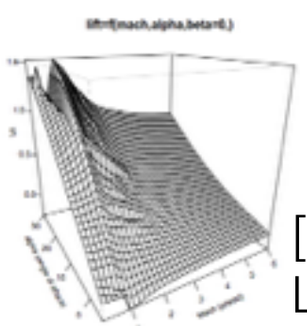
[Ewens 1972; Hartl, Clark 2003]

[Saria et al 2010]

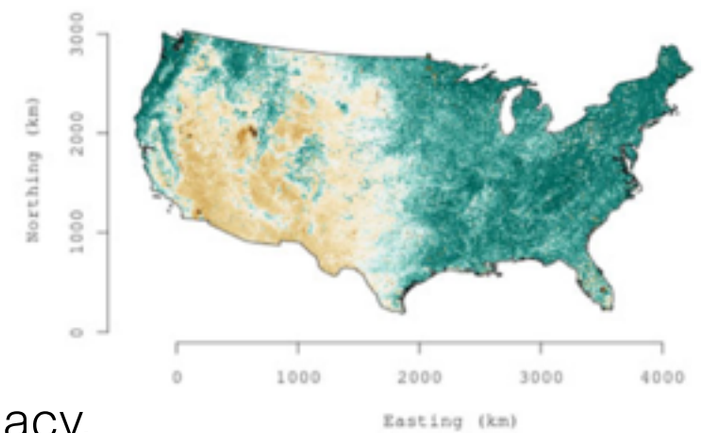


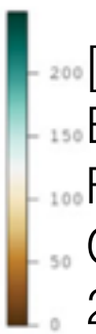
[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]



[Gramacy, Lee 2009]



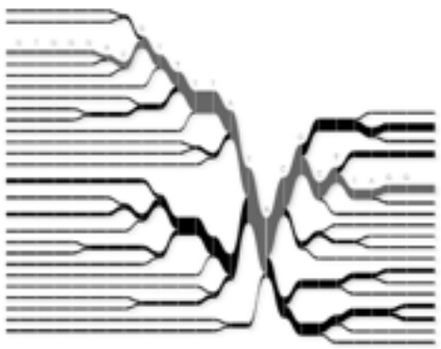

[Datta, Banerjee, Finley, Gelfand 2016]

[Chati, Balakrishnan 2017]

# Applications

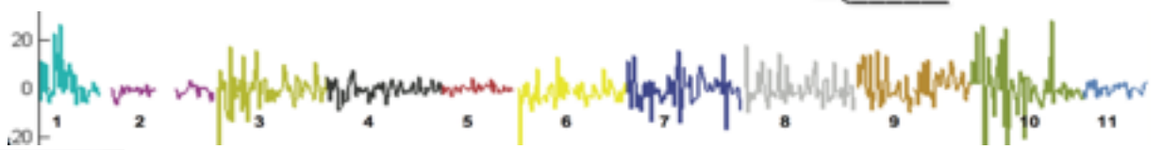
[wikipedia.org]

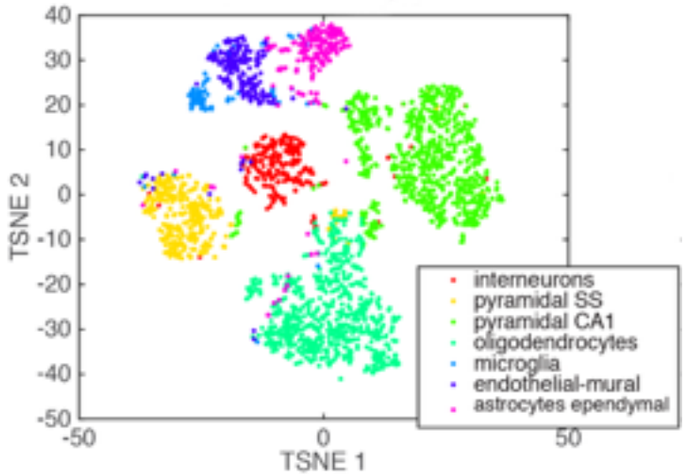
[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Saria et al 2010]

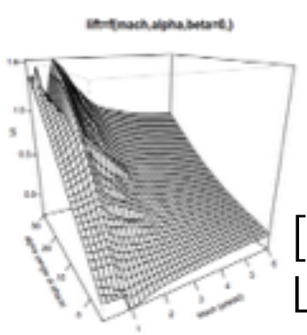


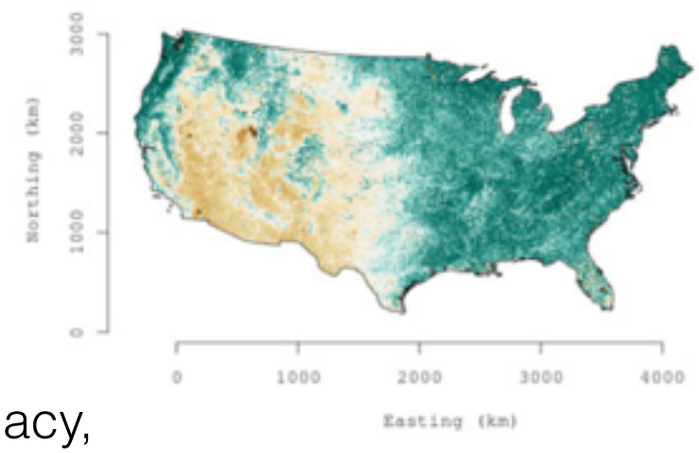

[Prabhakaran, Azizi, Carr, Pe'er 2016]

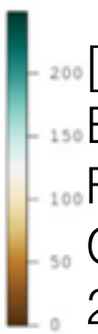
[Sudderth, Jordan 2009]

[US CDC PHIL; Futoma, Hariharan, Heller 2017]



[Gramacy, Lee 2009]




[Datta, Banerjee, Finley, Gelfand 2016]

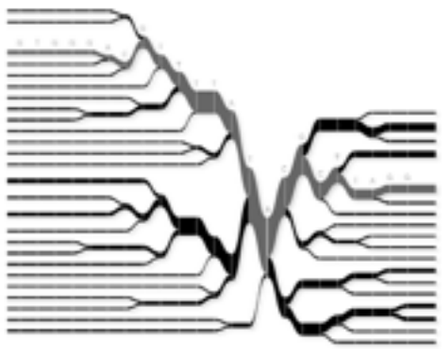
[Chati, Balakrishnan 2017]

# Applications

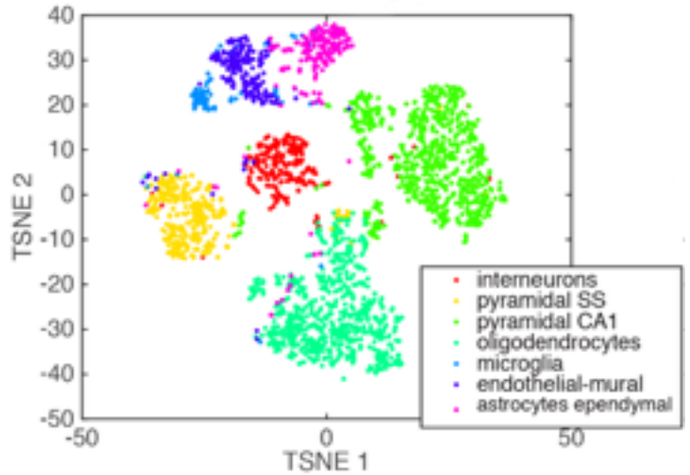
[wikipedia.org]

[Ed Bowlby, NOAA]

[Fox et al 2014]



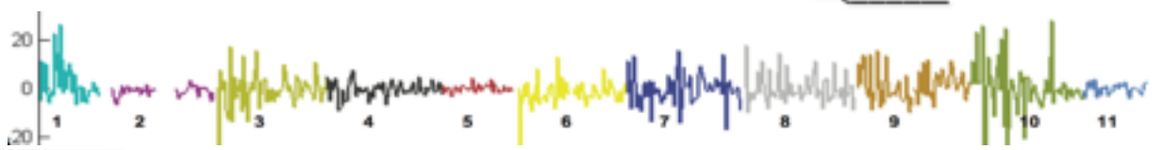
[Ewens 1972; Hartl, Clark 2003]



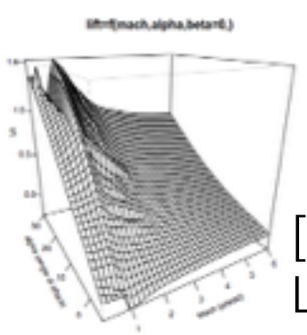

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

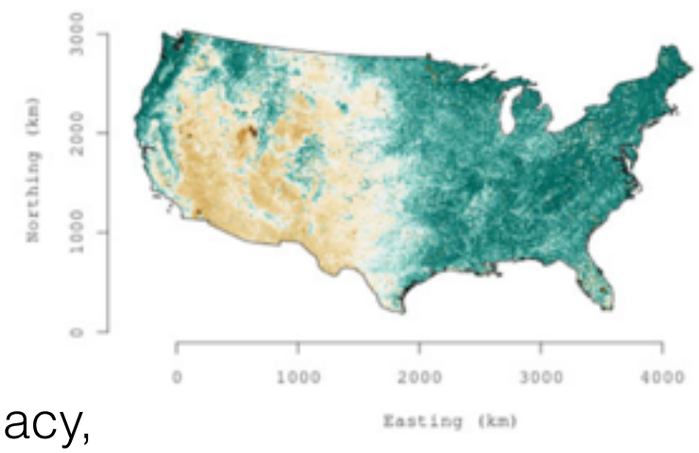
[Saria et al 2010]

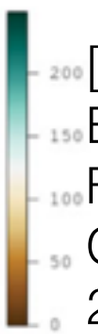


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



[Gramacy, Lee 2009]



[Datta, Banerjee, Finley, Gelfand 2016]

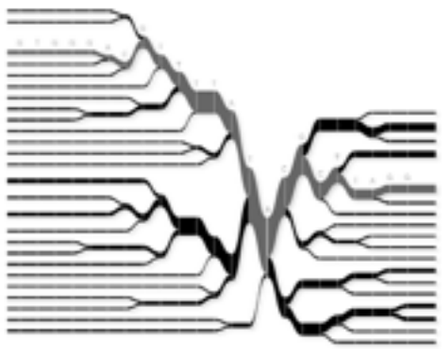
[Chati, Balakrishnan 2017]

# Applications

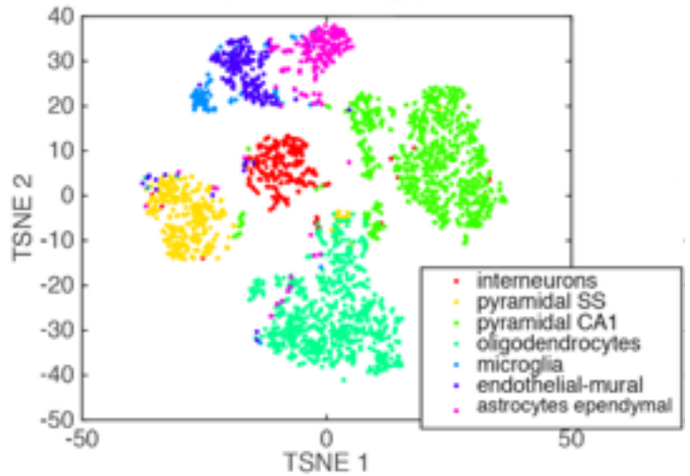
[wikipedia.org]

[Ed Bowlby, NOAA]

[Fox et al 2014]



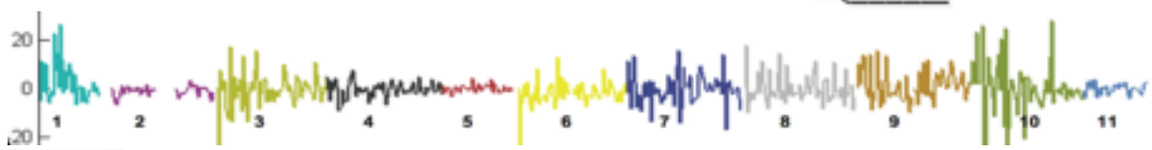
[Ewens 1972; Hartl, Clark 2003]



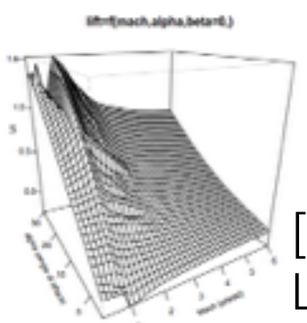

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

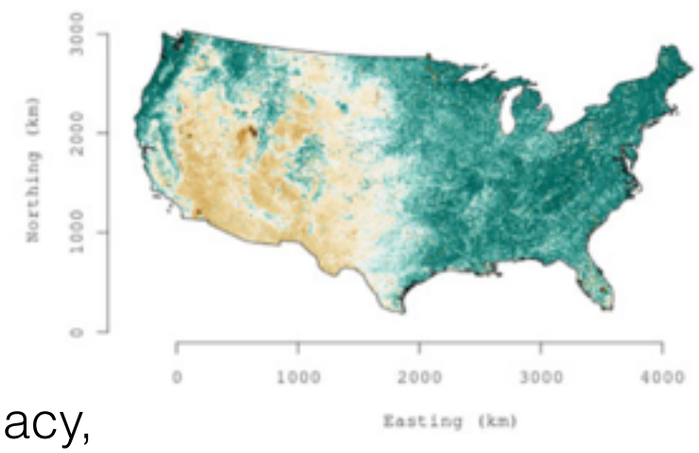
[Saria et al 2010]

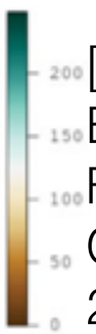


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



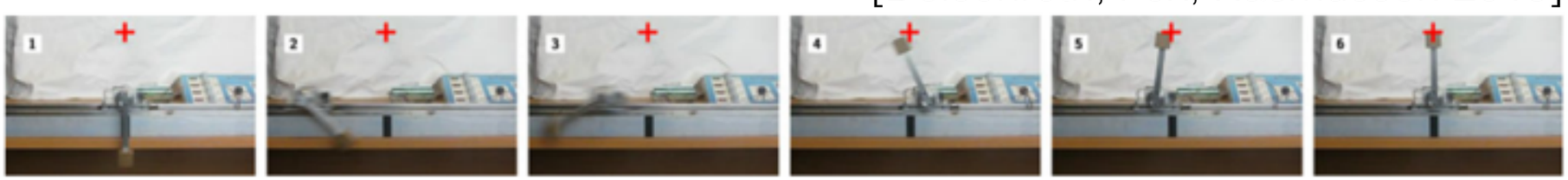
[Gramacy, Lee 2009]



[Datta, Banerjee, Finley, Gelfand 2016]

[Chati, Balakrishnan 2017]



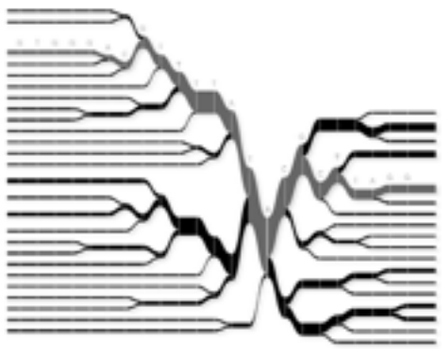
[Deisenroth, Fox, Rasmussen 2015]

# Applications

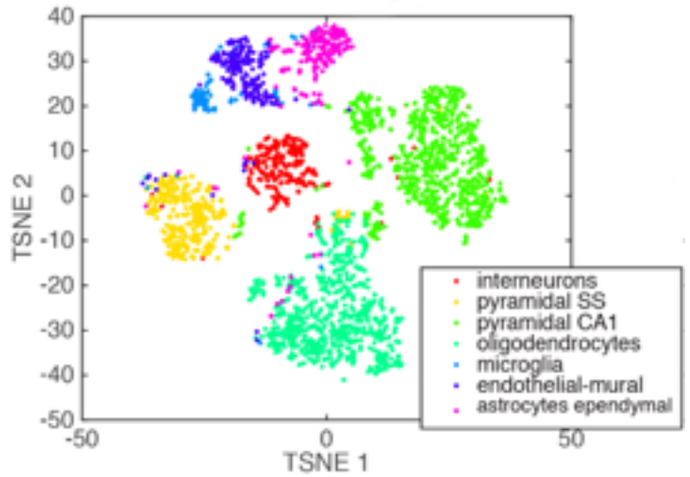
[wikipedia.org]

[Ed Bowlby, NOAA]

[Fox et al 2014]



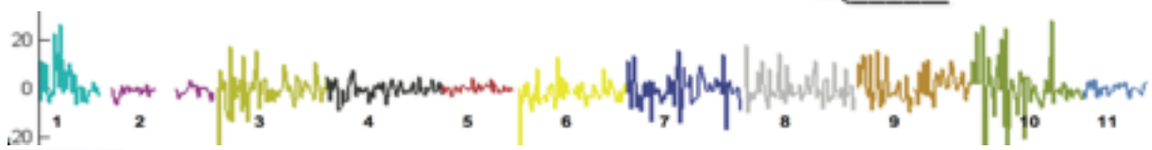
[Ewens 1972; Hartl, Clark 2003]



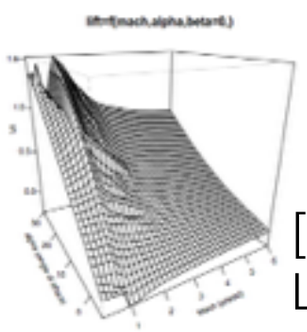

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

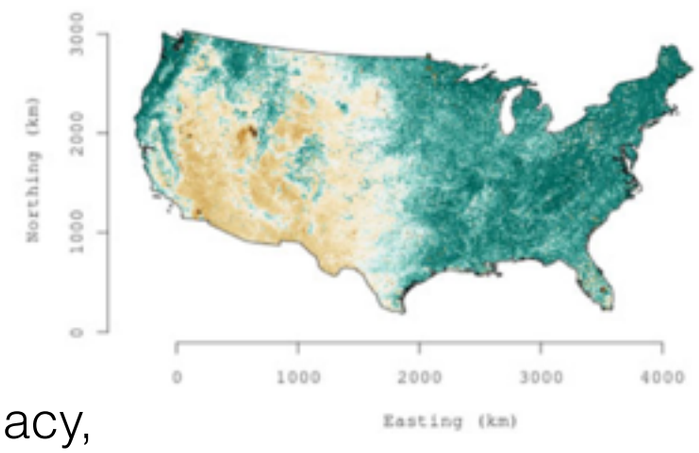
[Saria et al 2010]

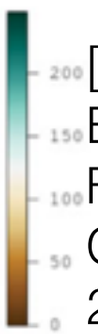


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



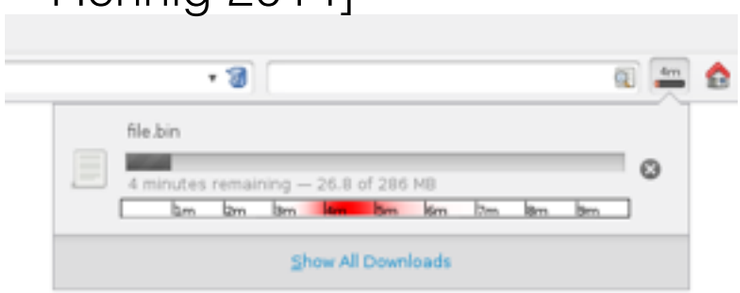
[Gramacy, Lee 2009]



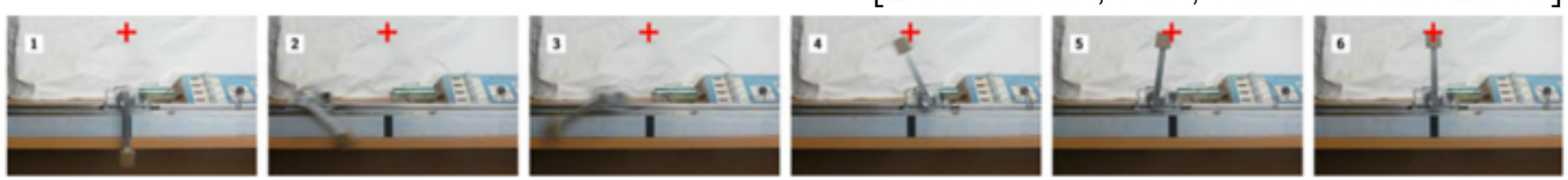
[Datta, Banerjee, Finley, Gelfand 2016]

[Kiefel, Schuler, Hennig 2014]




[Deisenroth, Fox, Rasmussen 2015]

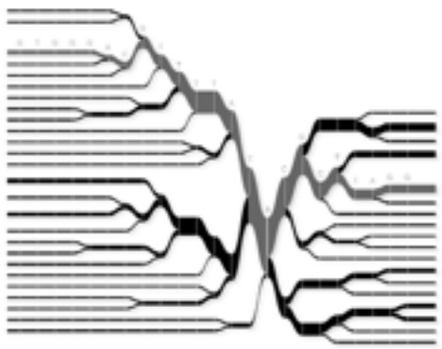
[Chati, Balakrishnan 2017]



# Applications

[wikipedia.org]

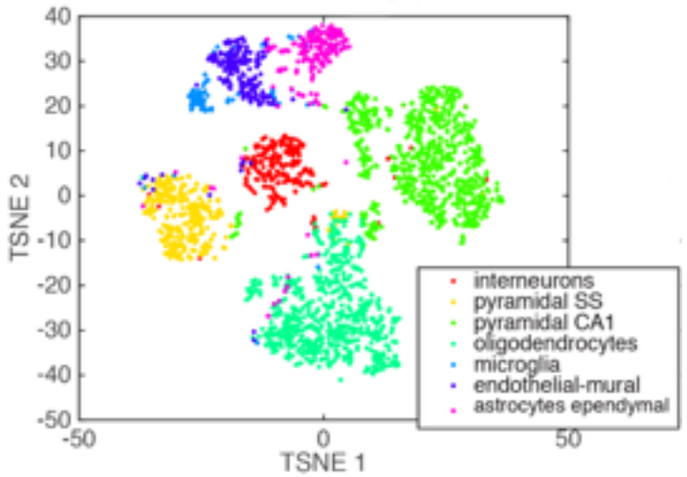
[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Fox et al 2014]

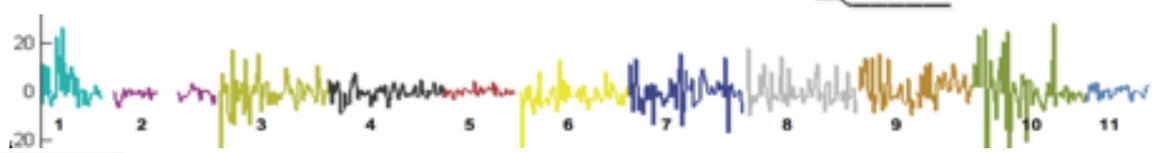
[Lloyd et al 2012; Miller et al 2010]



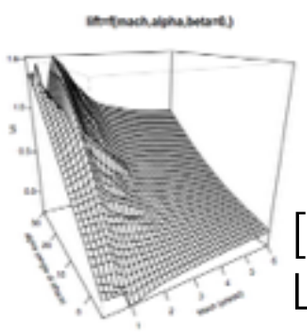

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

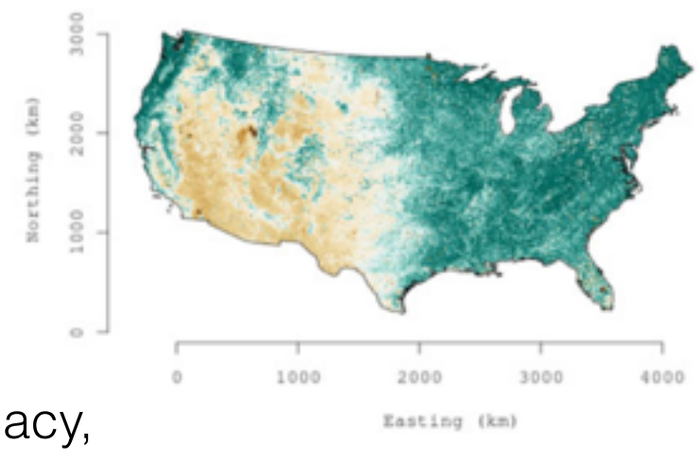
[Saria et al 2010]

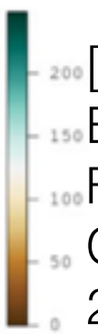


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



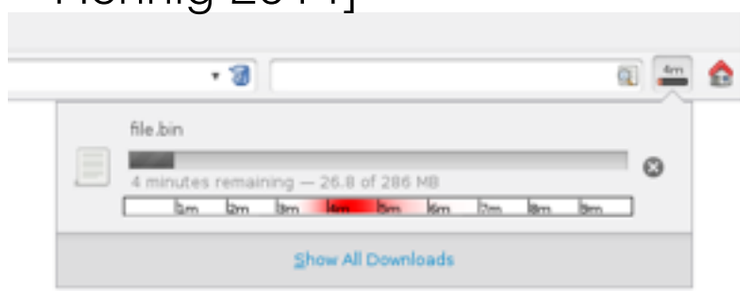
[Gramacy, Lee 2009]



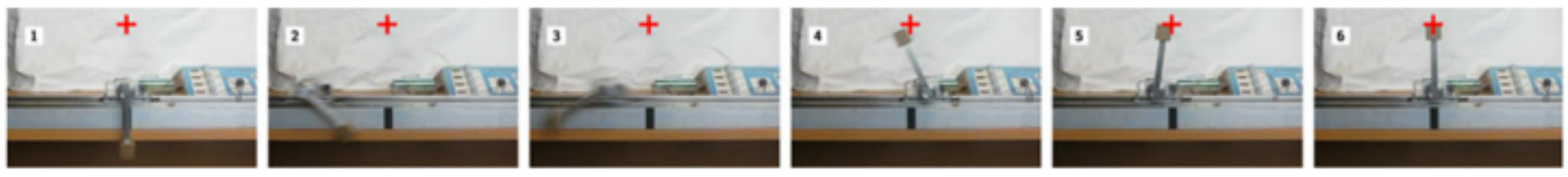
[Datta, Banerjee, Finley, Gelfand 2016]

[Kiefel, Schuler, Hennig 2014]




[Deisenroth, Fox, Rasmussen 2015]

[Chati, Balakrishnan 2017]



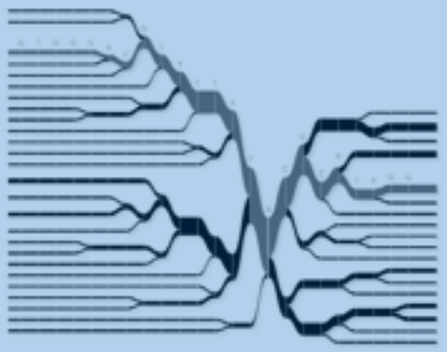
# Applications

[wikipedia.org]

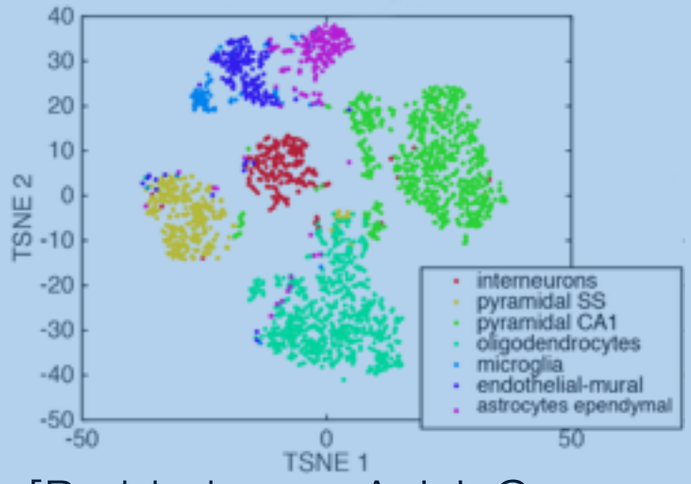
[Ed Bowlby, NOAA]

[Fox et al 2014]

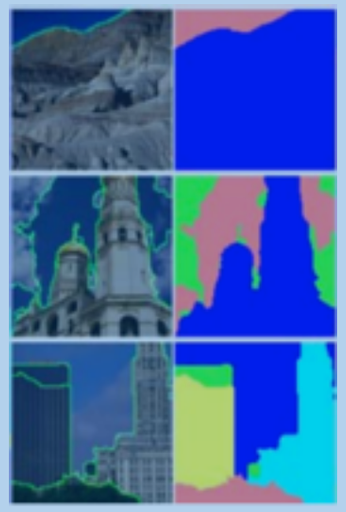
[Lloyd et al 2012; Miller et al 2010]



[Ewens 1972; Hartl, Clark 2003]

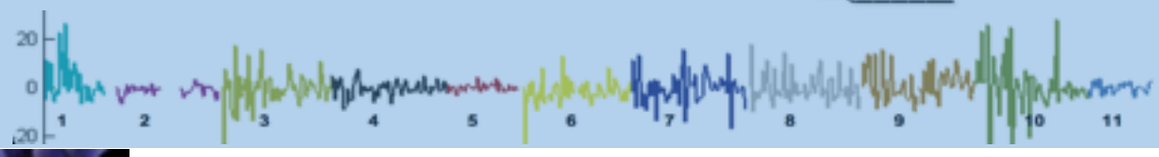



[Prabhakaran, Azizi, Carr, Pe'er 2016]

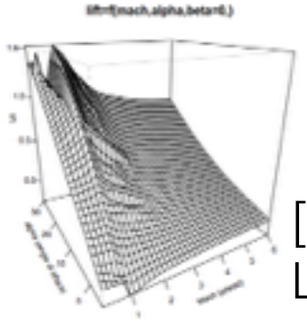


[Sudderth, Jordan 2009]

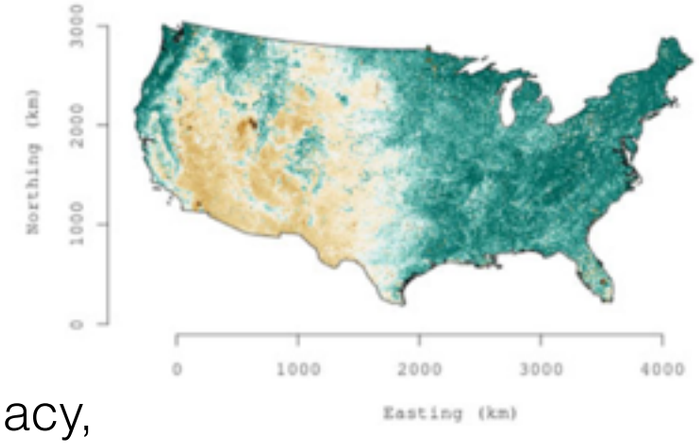
[Saria et al 2010]

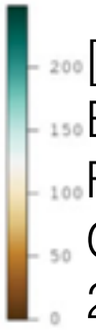


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



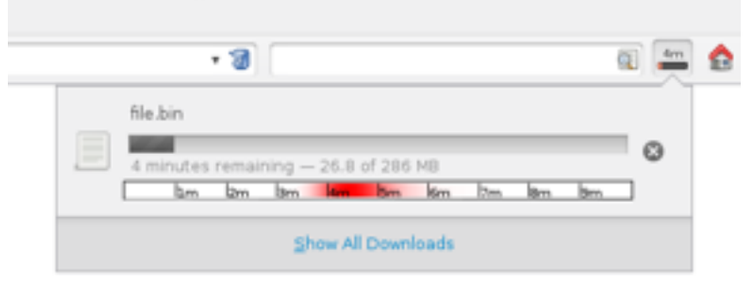
[Gramacy, Lee 2009]



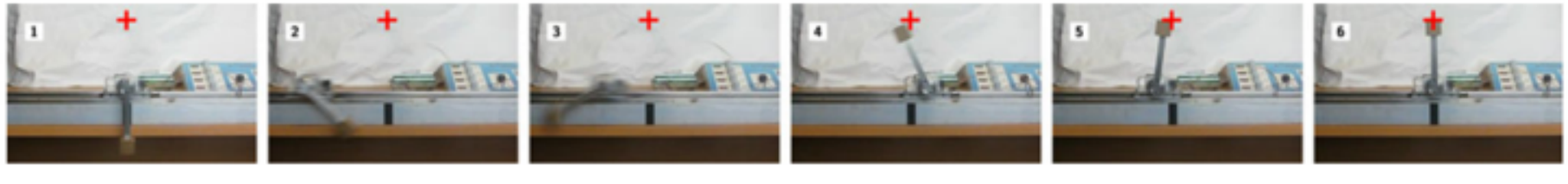
[Datta, Banerjee, Finley, Gelfand 2016]

[Kiefel, Schuler, Hennig 2014]




[Deisenroth, Fox, Rasmussen 2015]

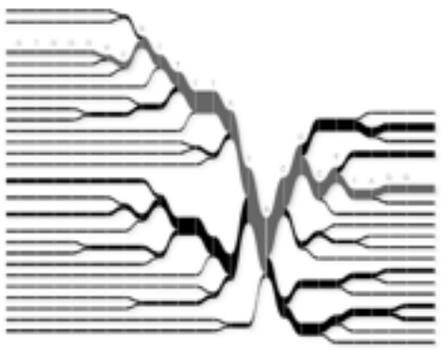
[Chati, Balakrishnan 2017]



# Applications

[wikipedia.org]

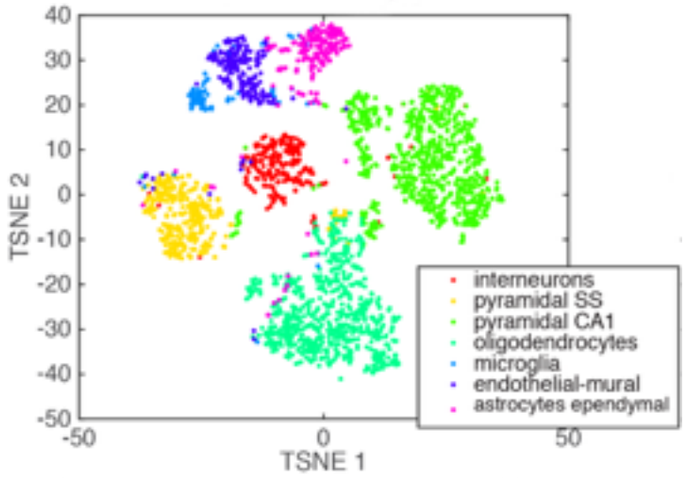
[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Fox et al 2014]

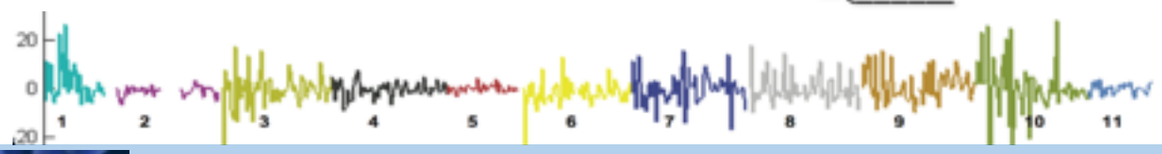
[Lloyd et al 2012; Miller et al 2010]



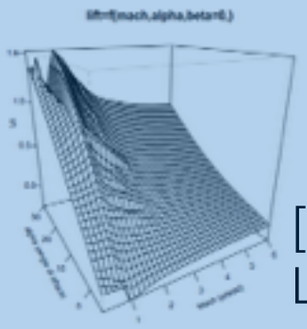

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

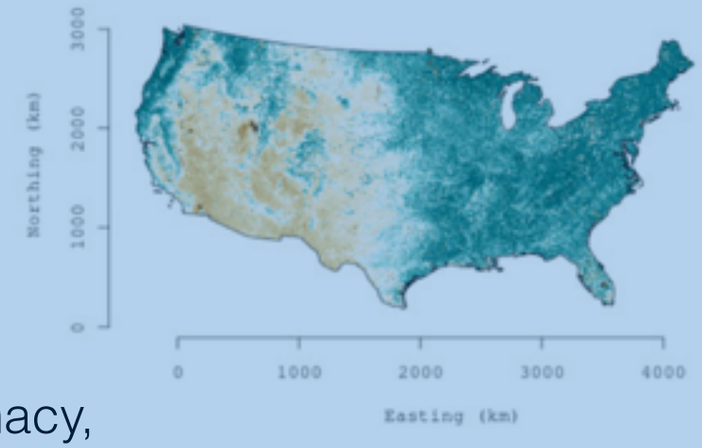
[Saria et al 2010]



[US CDC PHIL; Futoma, Hariharan, Heller 2017]

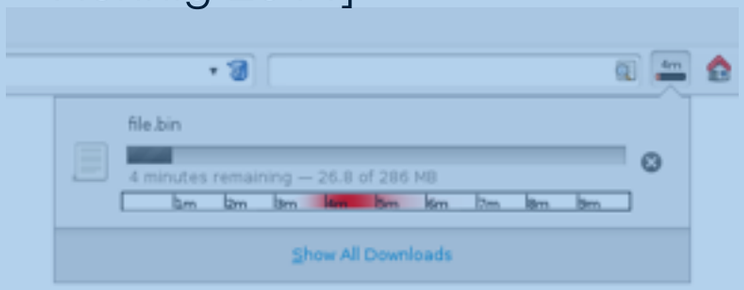


[Gramacy, Lee 2009]



[Datta, Banerjee, Finley, Gelfand 2016]

[Kiefel, Schuler, Hennig 2014]



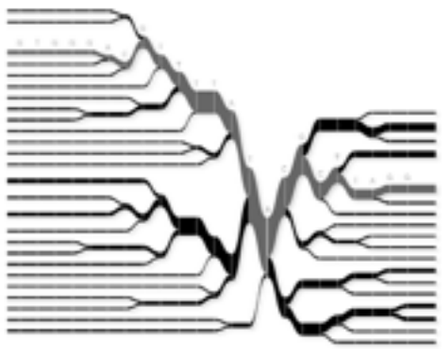

[Deisenroth, Fox, Rasmussen 2015]

[Chati, Balakrishnan 2017]

# Applications

[wikipedia.org]

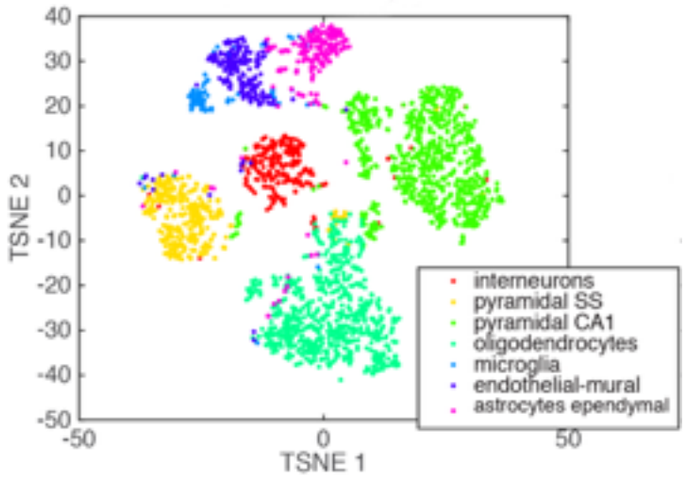
[Ed Bowlby, NOAA]



[Ewens 1972; Hartl, Clark 2003]

[Fox et al 2014]

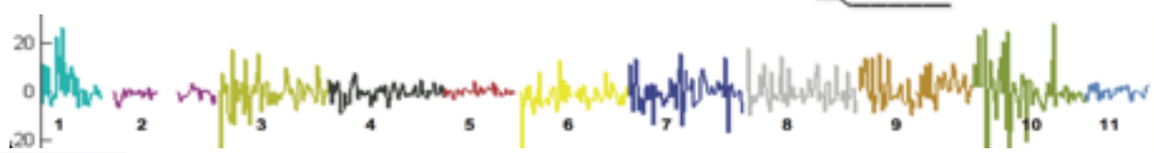
[Lloyd et al 2012; Miller et al 2010]



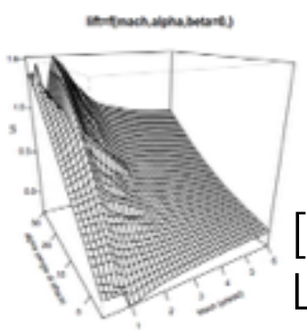

[Prabhakaran, Azizi, Carr, Pe'er 2016]

[Sudderth, Jordan 2009]

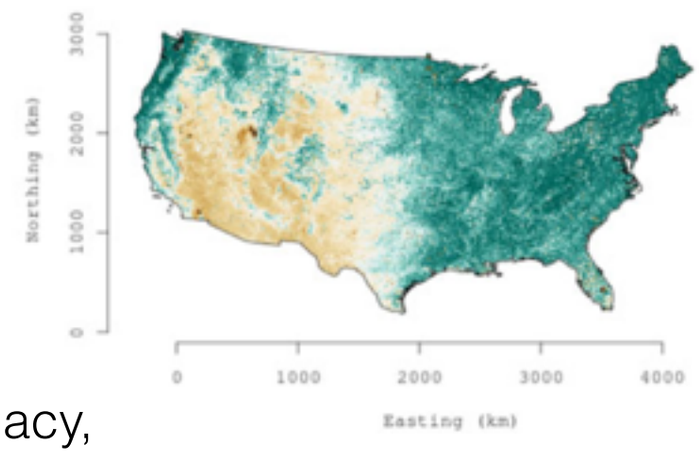
[Saria et al 2010]

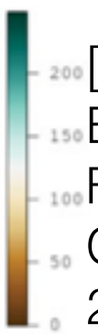


[US CDC PHIL; Futoma, Hariharan, Heller 2017]



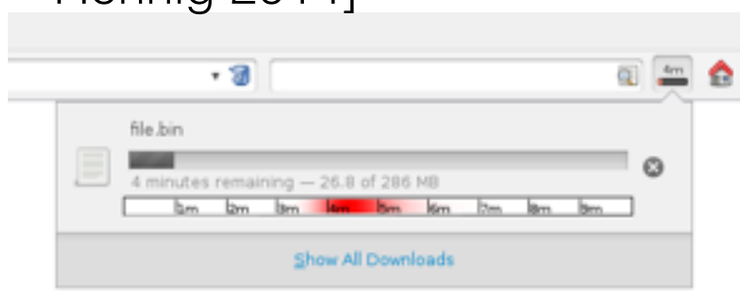
[Gramacy, Lee 2009]



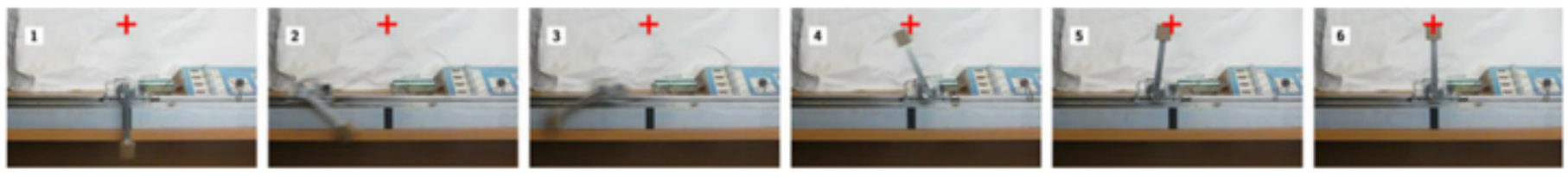
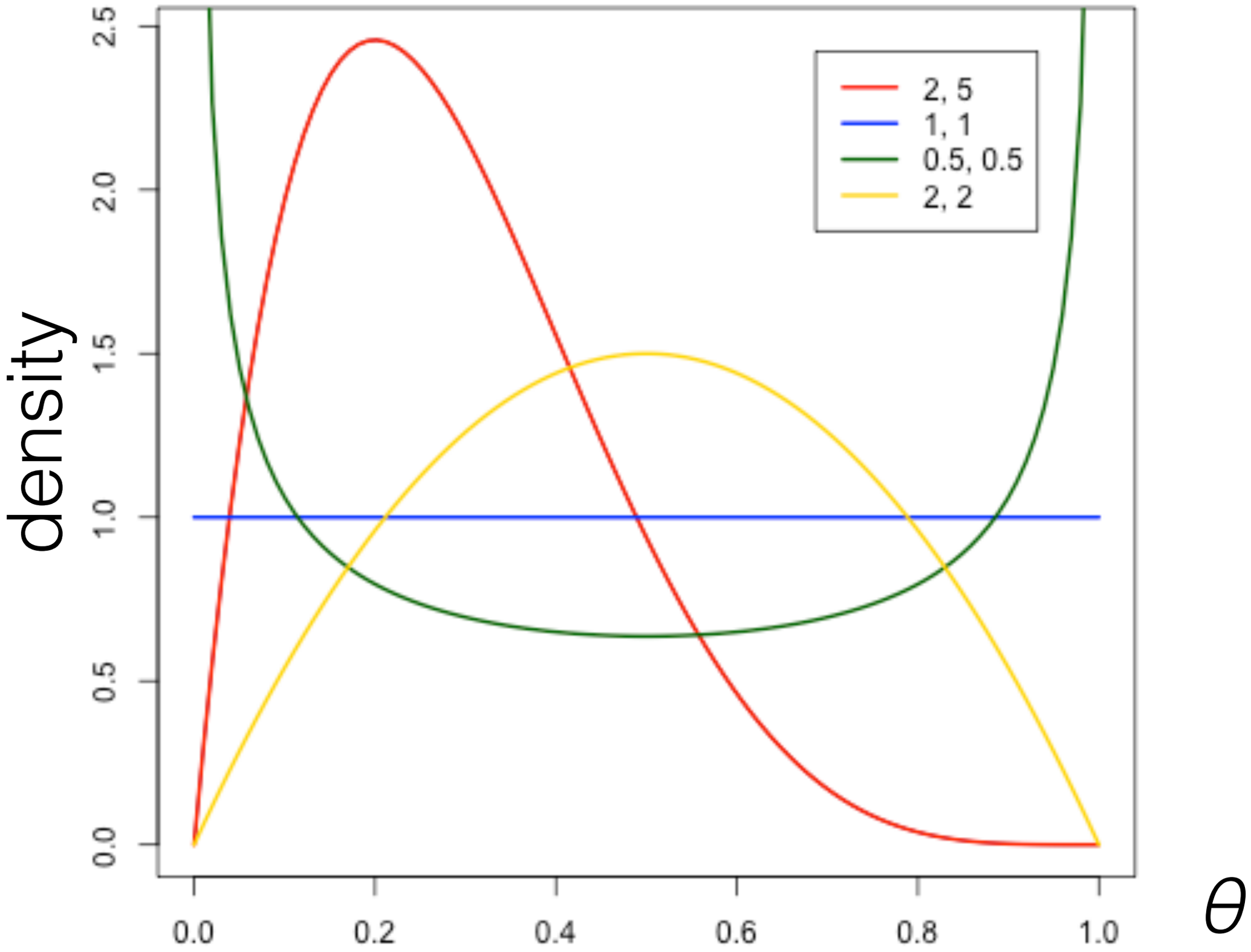
[Datta, Banerjee, Finley, Gelfand 2016]

[Kiefel, Schuler, Hennig 2014]




[Deisenroth, Fox, Rasmussen 2015]

[Chati, Balakrishnan 2017]



# Beta distribution