The 2009 Knowledge Discovery in Data Competition (KDD Cup 2009): Orange Customer Data

<http://www.mtome.com/Publications/CiML/CiML-v3-book.pdf>

Data Download link:<https://www.kdd.org/kdd-cup/view/kdd-cup-2009/Data>

Bayesian model selection approach to analysis of variance under heteroscedasticity:

<https://rss.onlinelibrary.wiley.com/doi/pdf/10.1111/1467-9884.00249>

Modeling the Uncertainty in Electronic Health Records: a Bayesian Deep Learning Approach:

<https://arxiv.org/abs/1907.06162>

^^ Surprisingly relevant

Bayesian Optimization with Robust Bayesian Neural Networks:

<https://arxiv.org/abs/1907.04240>

Heteroscedastic Gaussian Process Regression - <https://cs.stanford.edu/~quocle/LeSmoCan05.pdf>

what uncertainties do we need in baysian deep learning for computer vision - <https://papers.nips.cc/paper/7141-what-uncertainties-do-we-need-in-bayesian-deep-learning-for-computer-vision.pdf>

Bayes by Backprop (read in class, related to hw3, 4)

<http://proceedings.mlr.press/v37/blundell15.pdf>

# **We Need Bayesian Deep Learning for Safe AI**

<https://alexgkendall.com/computer_vision/bayesian_deep_learning_for_safe_ai/>

On adapting HW4 to use for this project:

* Change forward pass function to result in a mean and var (i.e. mean = f(x, w)\_1, var = f(x, w)\_2 and then use those outputs as the mean and var of our variational distribution.
* To predict churn given a feature set X, sample from Bern( sigmoid( N(f(x, w), v(x, w)) )

1. Change architecture of nn to output both mean and var of the likelihood function
2. Update draw sample from q to take both a mean and variance
3. in calc\_vi\_loss get your prediction by sampling q given both mean and variance

**Importance of Retaining Customers:**

<https://www.annexcloud.com/blog/21-surprising-customer-retention-statistics-2018/>

<https://www.destinationcrm.com/Articles/Web-Exclusives/Viewpoints/Listen-to-the-Voice-of-the-Customer-53239.aspx>