Additive Gaussian processes
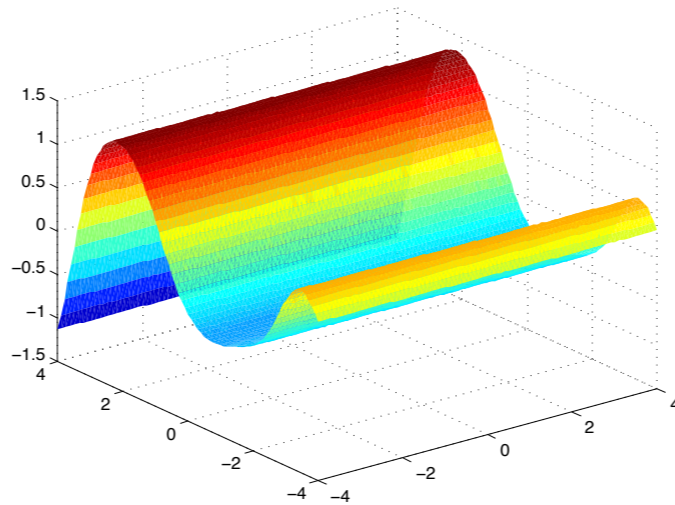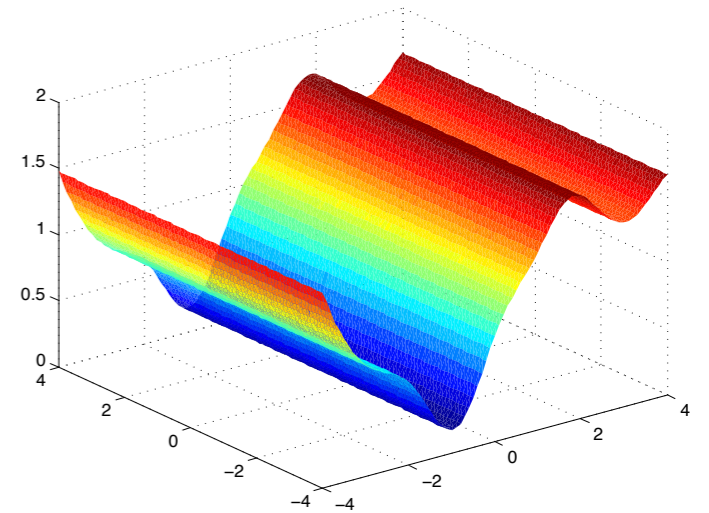

$$f_1(x_1) + f_2(x_2) \qquad = \qquad f_1(x_1) \qquad + \qquad f_2(x_2)$$
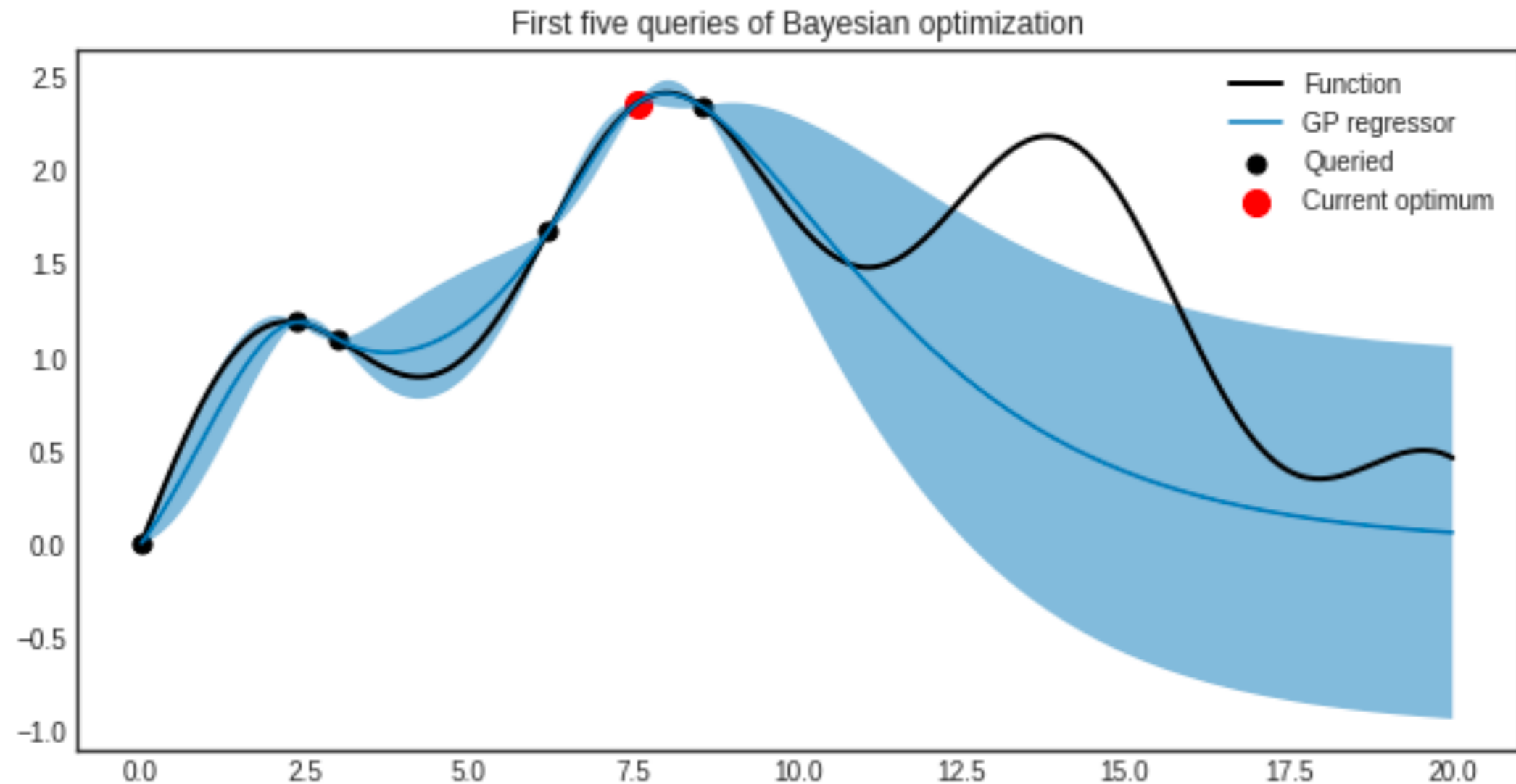
- Mix multiple GP's with different covariates / kernels

- Duvenaud et al. Additive Gaussian processes, 2011

- Duvenaud et al. Structure discovery in nonparametric regressio through compositional kernel search, 2013

Bayesian optimisation with GPs

First five queries of Bayesian optimization

- Shahriari et al: Taking the human out of the loop: A review of bayesian optimization, 2016

Bayesian quadrature
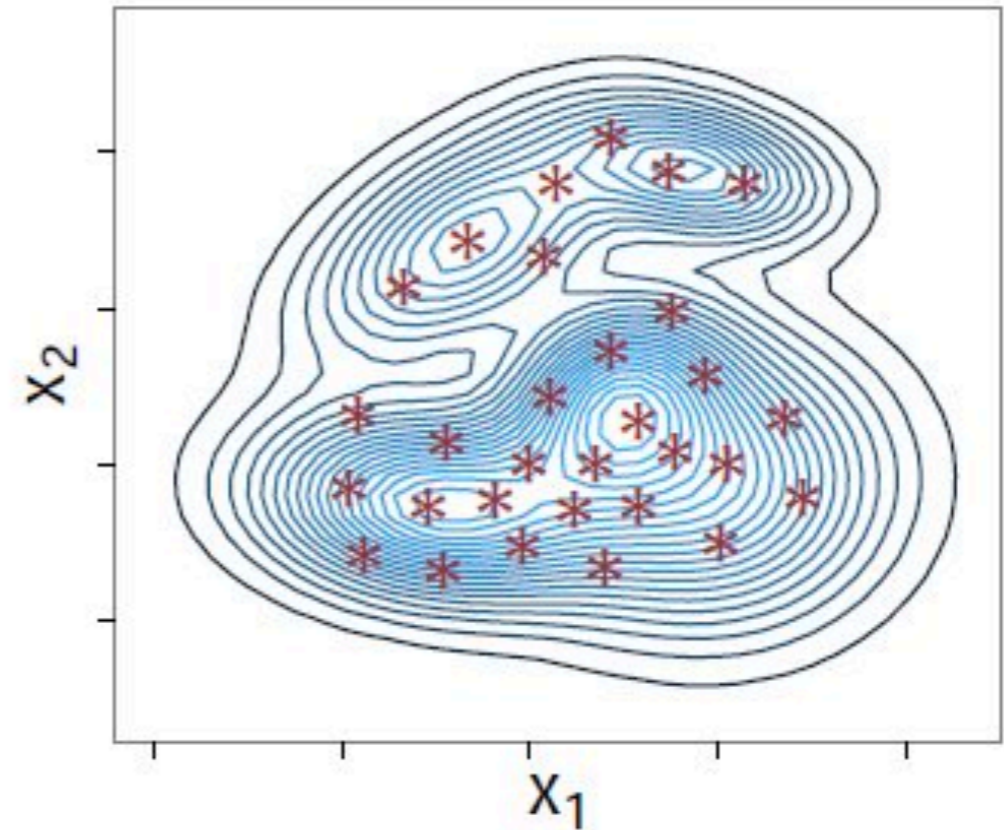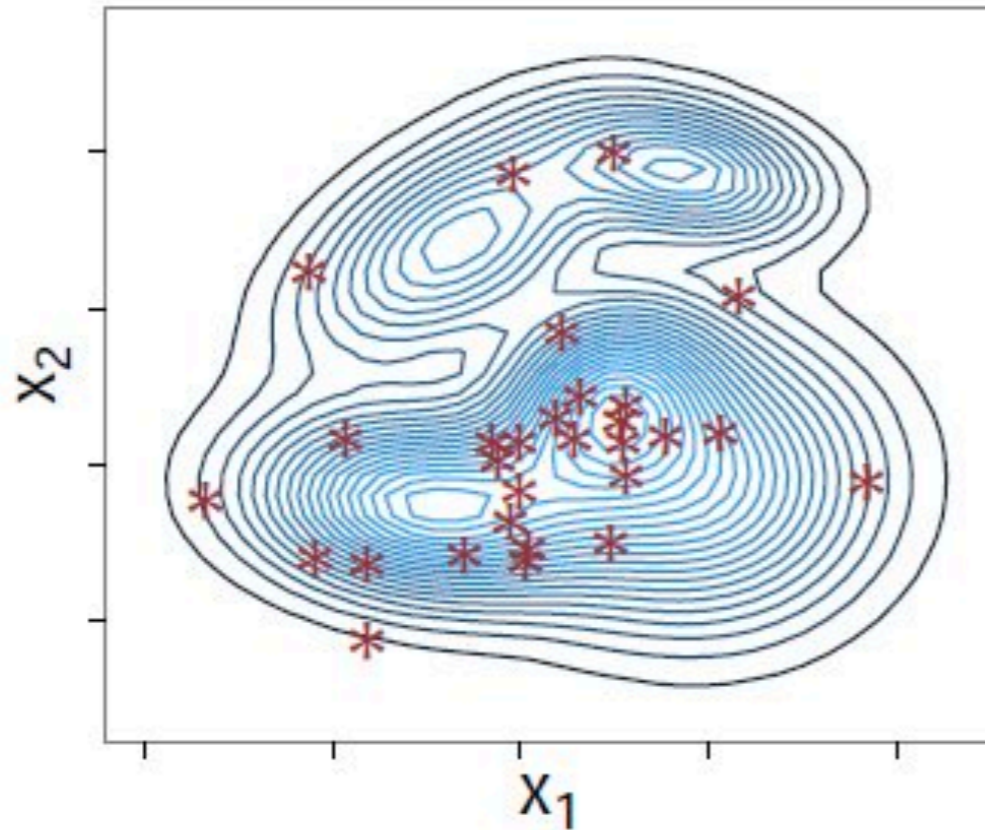
- Numerically approximate an integral using GP proxies

- Many references

Relationship between neural networks and GPs

- A neural network of infinite width converges (statistically) to a GP

- Williams: Computationa with infinite neural networks, 1998

- Matthews et al. Gaussian process behavior in wide deep neural networks, 2018

Multi-output GPs & Kronecker structures

- Bonilla et al. Multi-task Gaussian process prediction, 2006

- Stegle et al. Efficient inference in matrix-variate Gaussian models with iid observation noise

Gaussian processes for big data

- Scaling GPs to million/billion points

- Hensman et al: Scalable Variational Gaussian process Classification, 2015

- Wilson et al: Kernel Interpolation for Scalable Structured Gaussian Processes (KISS-GP), 2015
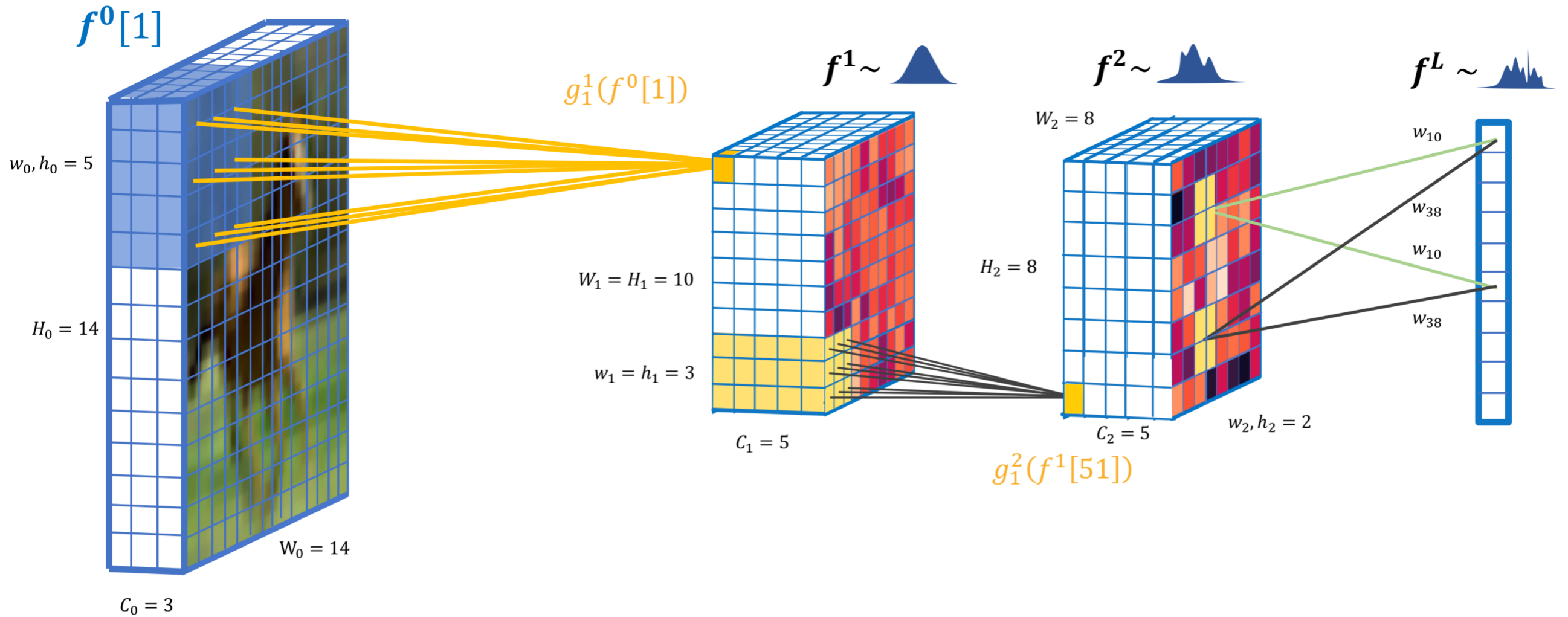
GPs with monotonicity
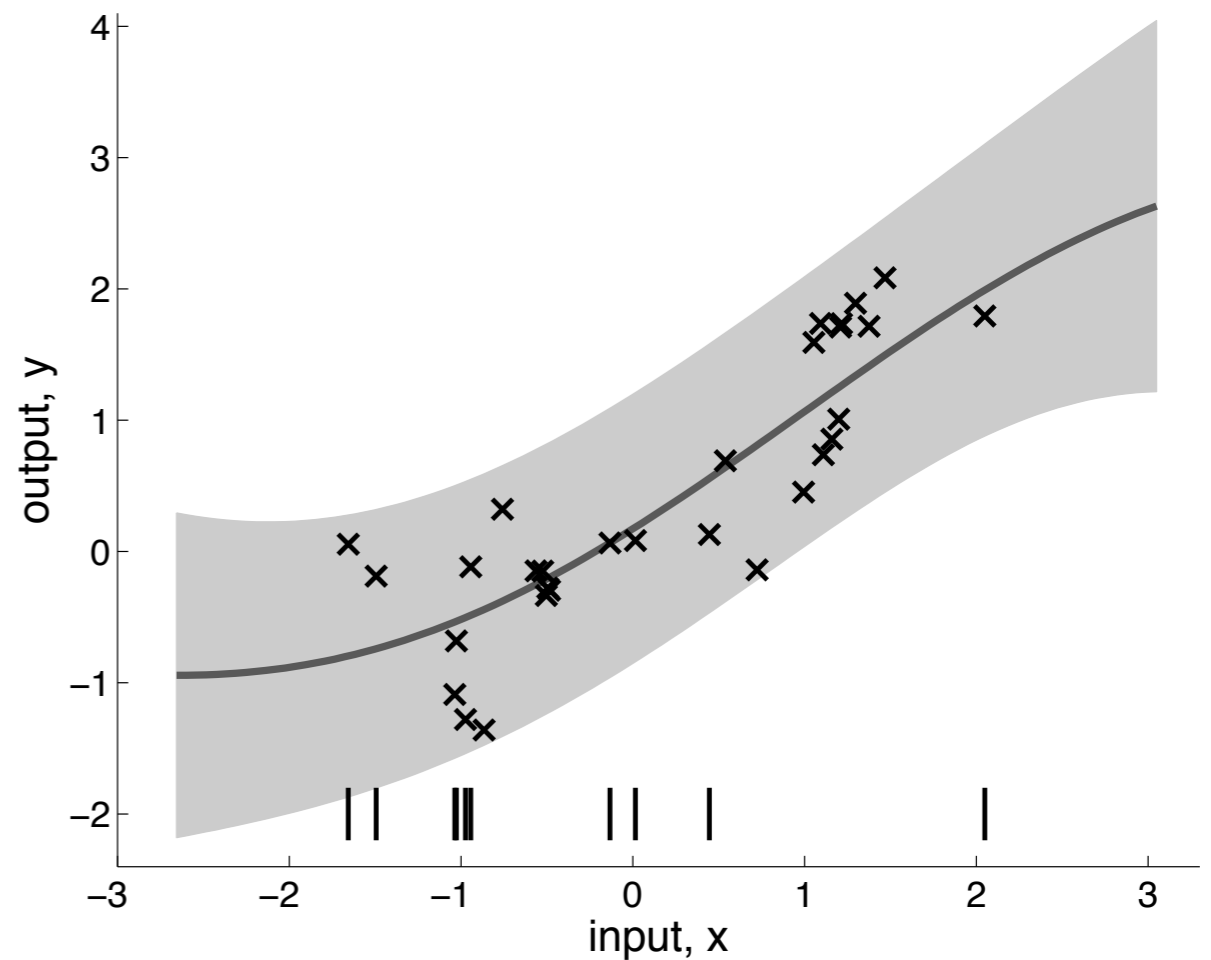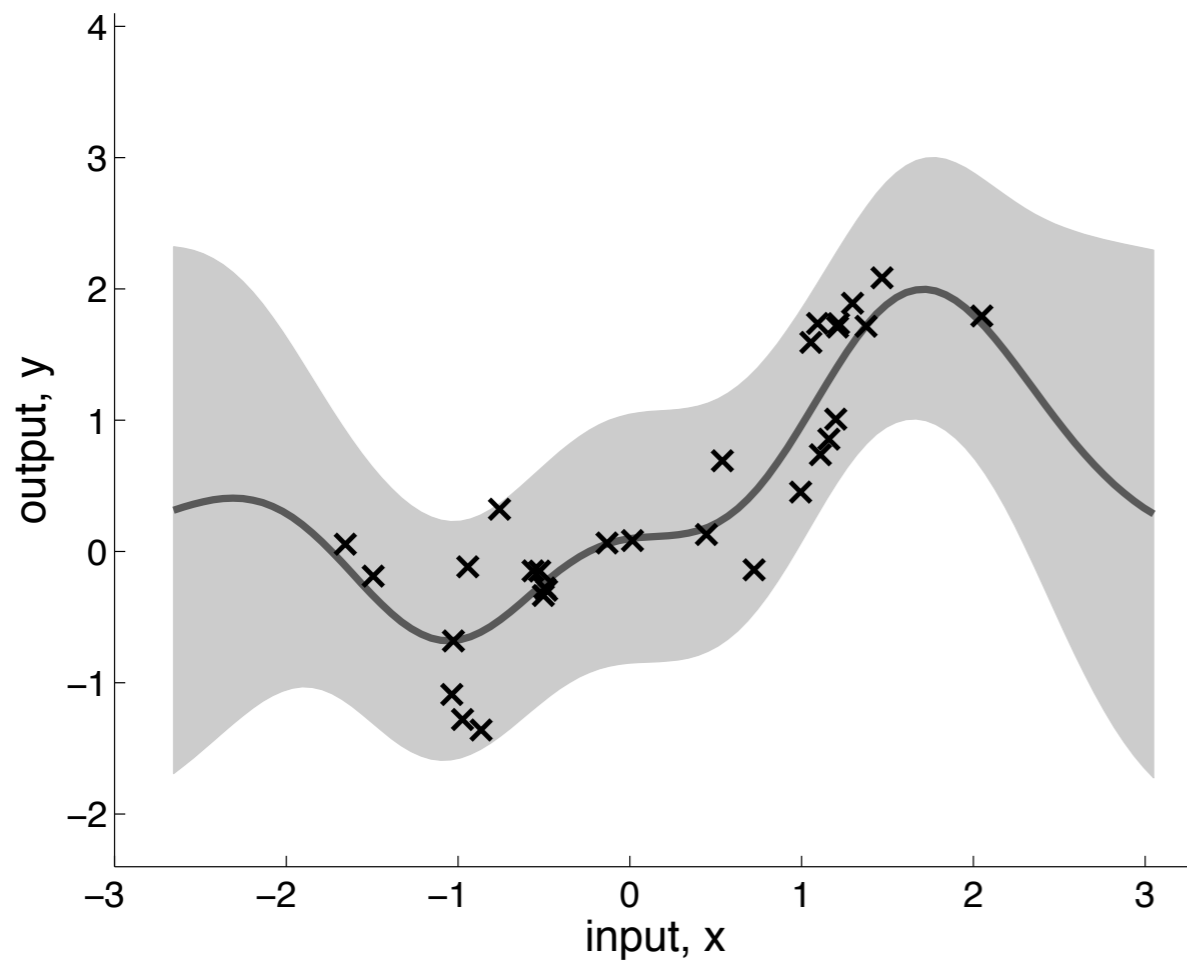
- Riihimäki et al. Gaussian processes with monotonicity information, 2011

GP latent variable models (GPLVMs)
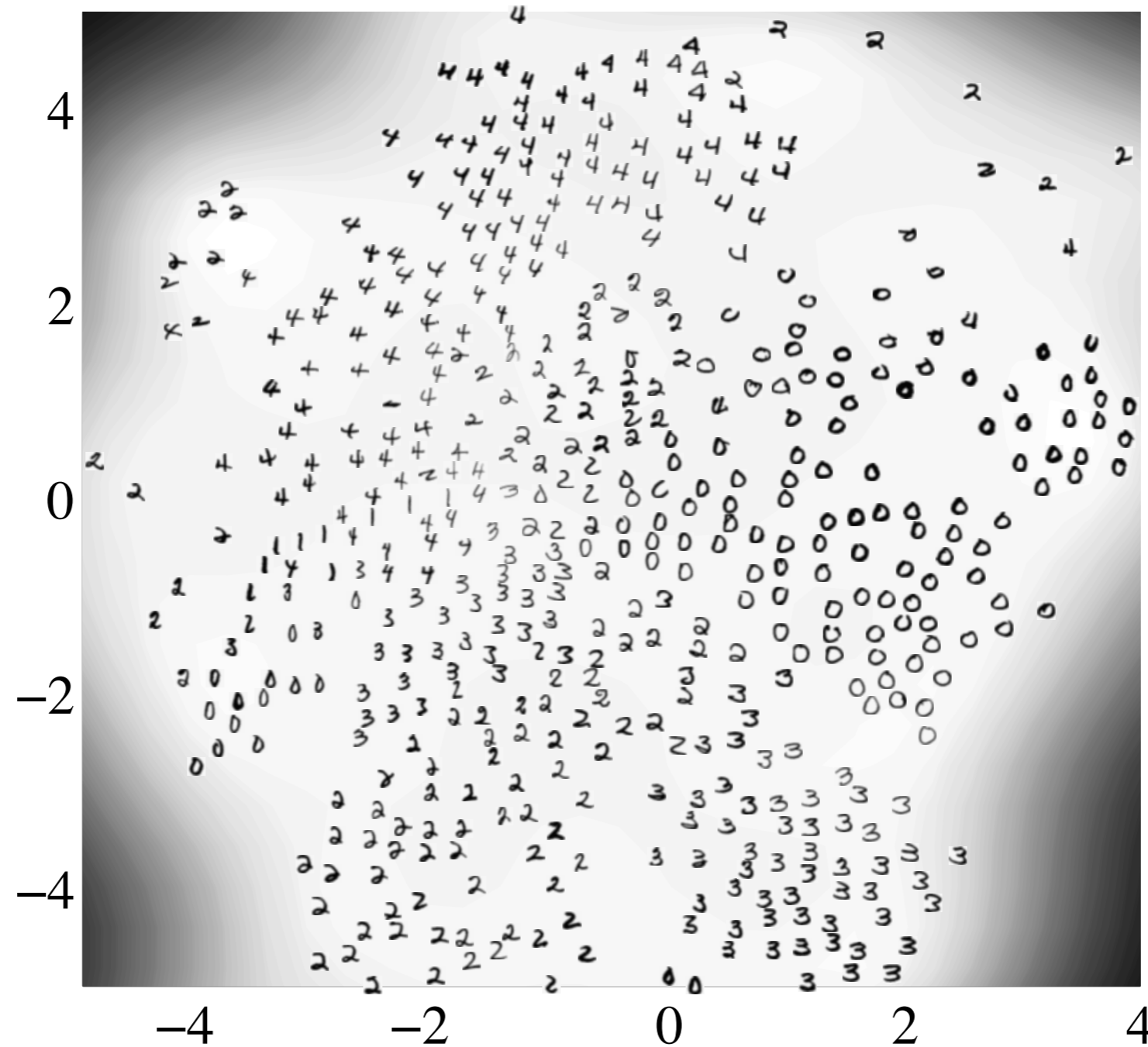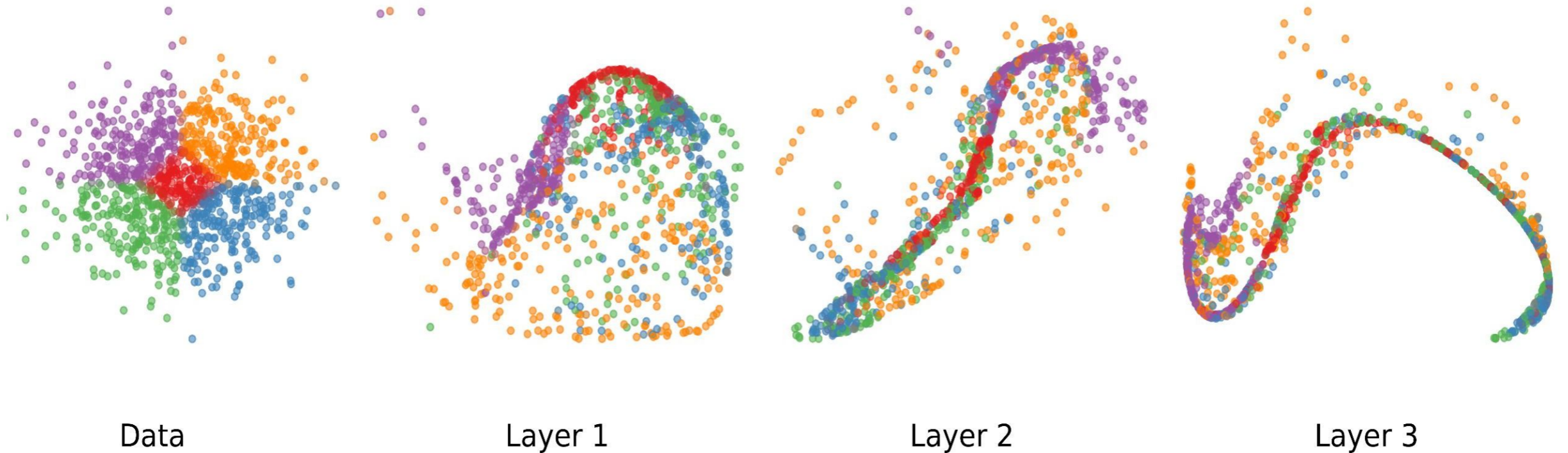

- Titsias et al. Bayesian Gaussian process latent variable model, 2010

Convolutional GP

- Van der wilk et al: Convolutional Gaussian process, 2017

Deep GPs

Data   Layer 1   Layer 2   Layer 3

- Damianou et al. Deep Gaussian processes, 2011

- Salimbeni et al. Doubly stochastic Deep Gaussian processes, 2017