Paper Homework 1

May 1, 2020

- Deadline: May 8, 2020 11:59 p.m.
- Instruction: Upload your answer sheets to new e3.
- Format: studentID_name_hw1.pdf. e.g. 0750000_Jason_hw1.pdf

1. Given the prior $p(z) \sim N(0, I)$ and the posterior approximation $q(z|x;\theta) \sim N(\mu_\theta(x), \sum_\theta(x))$, prove that $KL(q(z|x;\theta)||p(z))$ is tractable; that is, it can be the functions of $\mu_\theta(x)$ and $\sum_\theta(x)$, expressed as a closed-form expression. Both dimensions of multivariate Gaussian are n where mean $\mu_\theta(x)$ and covariance matrix $\sum_\theta(x) = diag(\sigma_1^2, \ldots, \sigma_n^2)$ are functions of x and the parameters θ of a neural network.