

## DATA130013: Homework 9

No hand-in required

1. If  $K_1$  and  $K_2$  are positive definite kernels, then their product  $K_1K_2$  is a positive definite kernel.
2. Let  $\gamma(s_1, s_2)$  be a semi-variogram, prove that it is a conditionally negative definite function, i.e., given any positive integer  $n$ , for all weights  $w_1, \dots, w_n$  satisfying  $\sum_{i=1}^n w_i = 0$ , and locations  $s_1, \dots, s_n$ , it holds that

$$\sum_{i=1}^n \sum_{j=1}^n w_i \gamma(s_i, s_j) w_j \leq 0.$$