1. The model is linear. There is no under-modeling. , , .
2. The model is nonlinear. There is no under-modeling., , , .
3. The model is linear. There is under-modeling.

文本

描述已自动生成

Code:

**def** generate\_U(u, d):

    n = len(u)

    Xdly = np.zeros((n, d))

    row = Xdly.shape[0]

    Xdly\_row = np.zeros((d, 1))

    for i in range(row):

        for j in range(d):

            Xdly\_row[j, :] = np.exp(-j \* u[i, :] / d)

        Xdly[i, :] = Xdly\_row.reshape(1, -1)

    return Xdly

dmax = 11

utr, uts, ytr, yts = train\_test\_split(u, y, test\_size=0.5)

dtest = np.arange(1, dmax)

nd = len(dtest)

mses = np.zeros(nd)

for it, d in enumerate(dtest):

    Utr = generate\_U(utr, d)

    Uts = generate\_U(uts, d)

    regr = LinearRegression().fit(Utr, ytr)

    yhat = regr.predict(Uts)

    mses[it] = np.mean((yhat - yts) \*\* 2)

optimal\_arg = np.argmin(mses)

optimal\_d = dtest[optimal\_arg]

print(optimal\_d)

1. Assume , ,

1. Assume

文本

描述已自动生成

图表, 折线图

描述已自动生成

1. When , bias is the largest
2. Let cancer volume to be , age to be , type I to be and type II to be .

Model 1:

Model 2:

Model 3:

1. There are two parameters in model 1, three parameters in model 2 and four parameters in model 3. Model 3 is the most complex.
2. Model 1:

Model 2:

Model 3:

1. The smallest mean RSS is 0.7.

Only model 3 satisfy . Thus, we should select model 3.