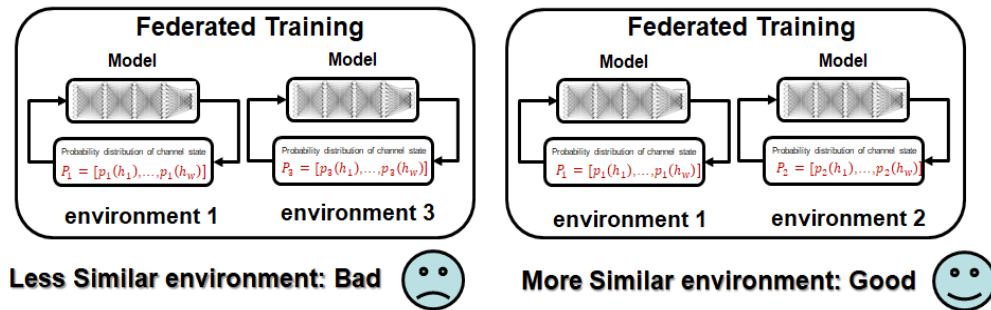
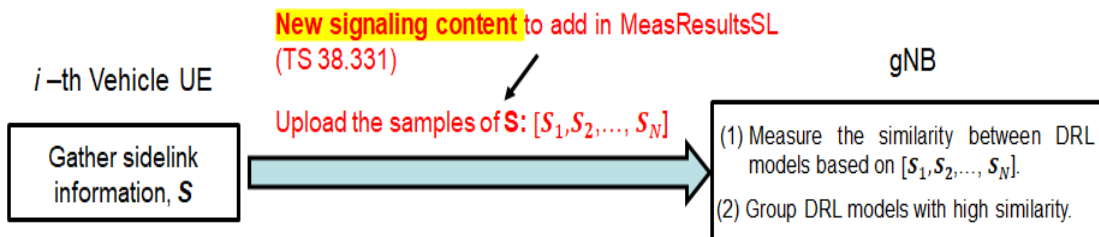


Federated Learning in V2X Communications for Side-link Enhancement

Problem : Different environment results in heterogeneity of dataset for device, leading to the degradation of FL performance



Solution : UE selection & Grouping



S is the sidelink information, which could be the channel busy ratio (already existed), RSRP, RSRQ, RSSI, SNR, CSI, NLOS/LOS), etc. We specifically add the probability distribution of channel state as the new content.

Measure of similarity: $P_i = [p_i(h_1), p_i(h_2), \dots, p_i(h_w)]$

Standard Impact :

MeasResultsSL information element (TS 38.331)

```
MeasResultsSL-r16 ::= SEQUENCE {
    measResultsListSL-r16 CHOICE {
        measResultNR-SL-r16
        ...
    },
    ...
}

MeasResultNR-SL-r16 ::= SEQUENCE {
    measResultListCBR-NR-r16 SEQUENCE (SIZE (1.. maxNrofSL-PoolToMeasureNR-r16)) OF
    MeasResultCBR-NR-r16,
    measResultListPDCS-NR SEQUENCE (XXXXX)
    measResultListOther-NR SEQUENCE (XXXXX)
    ...
}
```

Add new signaling “**measResultListPDCS-NR**” in MeasResultsSL to transmit the probability distribution of channel state $P_i = [p_i(h_1), p_i(h_2), \dots, p_i(h_w)]$ in sidelink i, where is the probability that sidelink is in channel state

Add new signaling “**measResultListOther-NR**” in MeasResultsSL to transmit other sidelink information such as RSRP, RSRQ, RSSI, SNR, CSI, NLOS/LOS, channel statistics (e.g., mean, variance), etc