# Special Topics: Audio and Music Processing
## Single-Team: LiszteningIn

| **Onset Detection** | **Tempo Estimation** | **Beat Detection** |
|---|---|---|
| STFT | Split d into 7 parts | pulse = abs(cos(2 pi TempiSec x)) |
| Complex Domain / LogFilt SpecFlux with Mel Scale | 7 autocorrelations for 7 parts | 7 crosscorrelations of pulse with d parts |



1 autocorrelation function

200 bmp     60 bmp



1 crosscorrelation function

1. beat location B
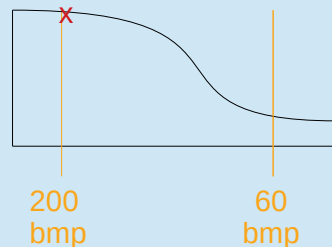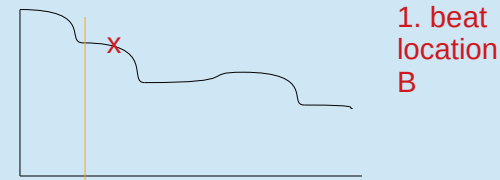
| | | |
|---|---|---|
| Onset Detection Function d | | |
| Peak Picking | Pick max and convert into bpm | NextBeatLocation = B + (c B) |
| Test F-score: | Test F-score: | Test F-score: |
| 0.332          0.38 | 0.22          0.298 | 0.16          0.198 |