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```
function Classification_V3()
```

=====

Description:

Classification_V3: classify band power feature of all electrode EEG

- Band on broad band and narrow band EEG
 - The Broad band feature frequency range from 7-30Hz
 - Narrow band consist of mu band(7 - 15Hz) and beta band (15 - 30Hz)

% - Classifier:

% - Support vector machine

% - Kernel function: Linear kernel function

% - Method: Least square error

=====

Process handels control file

Dataset control file

Process.File.Path = 'D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Resea

Process.File.Name{1} = 'Classification_V3-Input.txt'; % Input file

Process.File.Name{2} = 'Classification_V3-Output.txt'; % Output file

% Control file

```
for i = 1:length(Process.File.Name)
```

```
    Process.File.FullName{i} = fullfile(Process.File.Path, Process.File.Name{i});
```

```
end
```

% Dataset file

```
for i = 1:length(Process.File.FullName)
```

```
    fid = fopen(Process.File.FullName{i});
```

```
    Process.File.Dataset{i} = textscan(fid, '%s', 'delimiter', '\n');
```

```
    fclose(fid);
```

```
end
```

=====

Feature Extraction Process

```
for File = 1:length(Process.File.Dataset{1,1}{1})
```

```
Load dataset
```

```
display('-----');
display(strcat('Loading dataset <',num2str(File), '>'));
display(Process.File.Dataset{1,1}{1}{File});
Process.Data.Main          = load(Process.File.Dataset{1,1}{1}{File});
```

```
-----
Loading dataset <1>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <2>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <3>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <4>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <5>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <6>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <7>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <8>
```

```
D:\CHUM Pharino Master 2011-2013\Master 2011-2013\Research Paper\Database\
```

```
-----
Loading dataset <9>
```

```
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```

```
-----
Classification EEG pattern using 2 band of frequency
```

```
for Band = 1:4
```

```
    % Selecting frequency band
    switch Band
```

```

        case 1 % Mu band
            Process.Data.Temp.Classification.Feature.Select = Process.Data.Mai
        case 2 % Beta band
            Process.Data.Temp.Classification.Feature.Select = Process.Data.Mai
        case 3 % Mu and Beta band
            Process.Data.Temp.Classification.Feature.Select = Process.Data.Mai
        case 4 % Broad band
            Process.Data.Temp.Classification.Feature.Select = Process.Data.Mai
    end

    % Rearrange feature vector
    Process.Data.Temp.Classification.Feature.Select = Process.Data.Temp.Classi

    % Classification using SVM
    display('Performing classification data...');
    [ Process.Data.Temp.Classification.Result.ErrorMean, Process.Data.Temp.Cla
        'linear',...
        'LS',...
        'Train-Test',...
        Process.Data.Main.Information.CrossValidation,...
        Process.Data.Main.Information.class_output,...
        Process.Data.Temp.Classification.Feature.Select);

    Process.Data.Temp.Classification.Result.AccuracyMean = 100 - 100.*Proce
    Process.Data.Output.AccuracyMean(File,Band,:) = Process.Data.Tem
    Process.Data = rmfield(Process.Data,'Temp');
end

display(strcat('Finish dataset subject <',num2str(File), '>'));

    Performing classification data...
    Performing classification data...
    Performing classification data...
    Performing classification data...
    Finish dataset subject <1>

    Performing classification data...
    Performing classification data...
    Performing classification data...
    Performing classification data...
    Finish dataset subject <2>

    Performing classification data...
    Performing classification data...
    Performing classification data...
    Performing classification data...
    Finish dataset subject <3>

    Performing classification data...
    Performing classification data...
    Performing classification data...
    Performing classification data...
    Finish dataset subject <4>

    Performing classification data...

```

```
Performing classification data...
Performing classification data...
Performing classification data...
Finish dataset subject <5>
```

```
Performing classification data...
Performing classification data...
Performing classification data...
Performing classification data...
Finish dataset subject <6>
```

```
Performing classification data...
Performing classification data...
Performing classification data...
Performing classification data...
Finish dataset subject <7>
```

```
Performing classification data...
Performing classification data...
Performing classification data...
Performing classification data...
Finish dataset subject <8>
```

```
Performing classification data...
Performing classification data...
Performing classification data...
Performing classification data...
Finish dataset subject <9>
```

```
end
```

=====

```
Create EEG structure for saving data
```

```
display(strcat('Saving dataset <',num2str(File),'>'));
Save      = Process.Data.Output.AccuracyMean;
```

```
save(Process.File.Dataset{1,2}{1}{1}, 'Save');
Process = rmfield(Process, 'Data');
```

```
Saving dataset <9>
```

```
end
```

```
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```