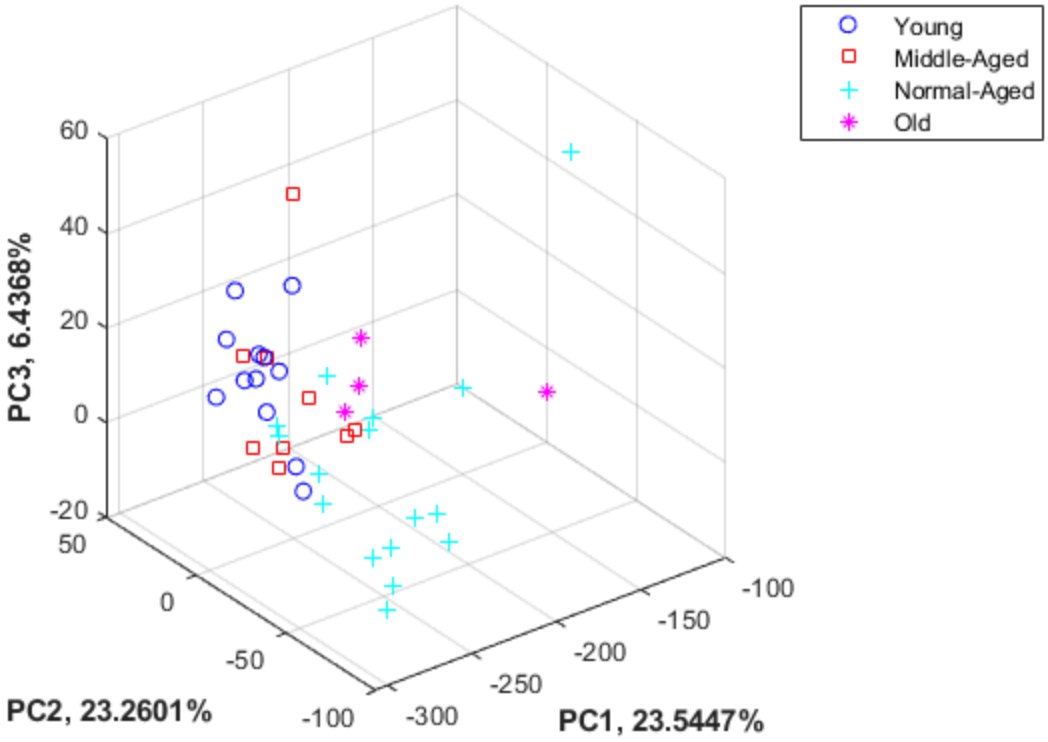
```
% BE 700 A1 Fall 2024
% Final Project, Data Exploration
% Cal Parise, 11/30/2024

brain_data = readtable("Human Brain Data Clean.csv");

gene_id = brain_data.IDENTIFIER;

brain_data_clean = table2array(removevars(brain_data,[1 2]))';

young = brain_data_clean(1:12,:); % first 12 patients are young adults (<40yo)
mid_age = brain_data_clean(13:21,:); % next 9 are middle aged (40-70yo)
norm_age = brain_data_clean(22:37,:); % next 16 normal aged (70-94yo)
old = brain_data_clean(38:end,:); % final 4 old aged

[coeff,~,~,~,explained] = pca(brain_data_clean);

brain_projected = brain_data_clean * coeff;

young_proj = brain_projected(1:12,:);
mid_proj = brain_projected(13:21,:);
norm_proj = brain_projected(22:37,:);
old_proj = brain_projected(38:end,:);

figure(2)
view(3)
hold on
scatter3(young_proj(:,1),young_proj(:,2),young_proj(:,3),"bo");
scatter3(mid_proj(:,1),mid_proj(:,2),mid_proj(:,3),"rs");
scatter3(norm_proj(:,1),norm_proj(:,2),norm_proj(:,3),"c+");
scatter3(old_proj(:,1),old_proj(:,2),old_proj(:,3),"m*");

xlabel("PC1, "+num2str(explained(1))+"%","FontWeight","bold")
ylabel("PC2, "+num2str(explained(2))+"%","FontWeight","bold")
zlabel("PC3, "+num2str(explained(3))+"%","FontWeight","bold")
legend("Young","Middle-Aged","Normal-Aged","Old")
grid on
hold off
```



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