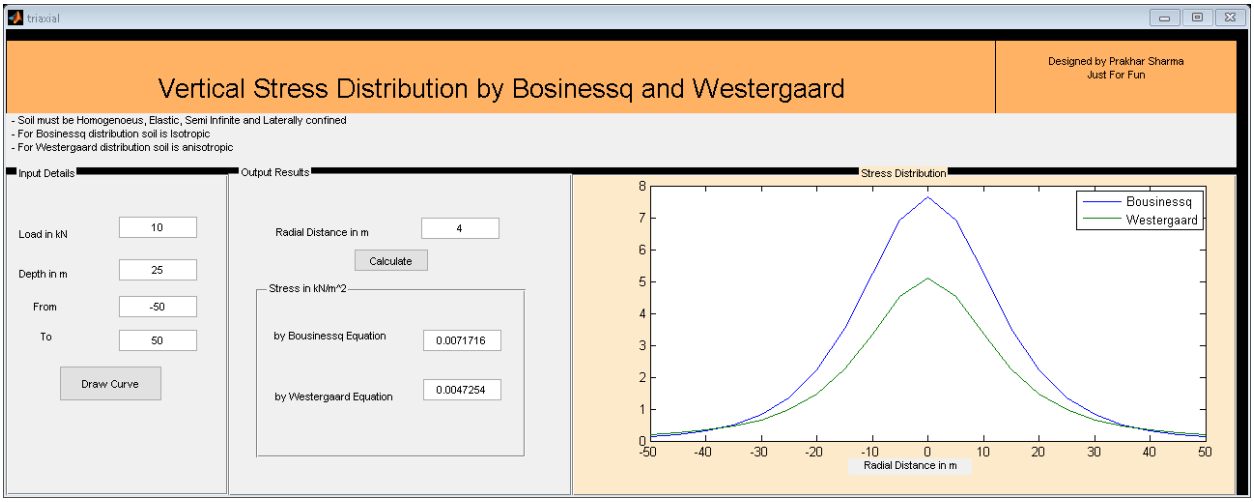
Sample of Coding

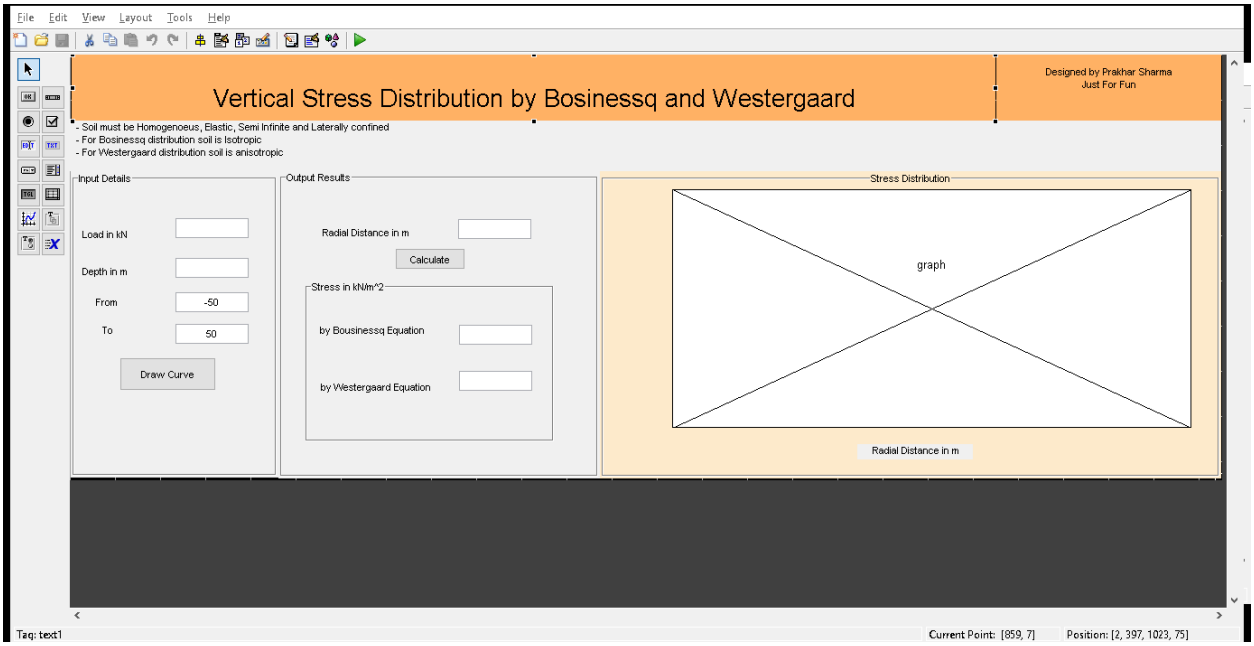
My primary area of interest is computational civil Engineering. In past two years I have created numerous Matlab GUIs, out of which I would present some of my favourite GUIs. These are my original works and I don't think you will find these things anywhere on Internet.

1) Vertical Stress Distribution by Bosinessq Equation and Westergaard Equation



Screenshot of GUI

(A) Figure File



Screenshot of figure file

(B) .m File

Main functions are shown as the whole file consist of is 600 lines.

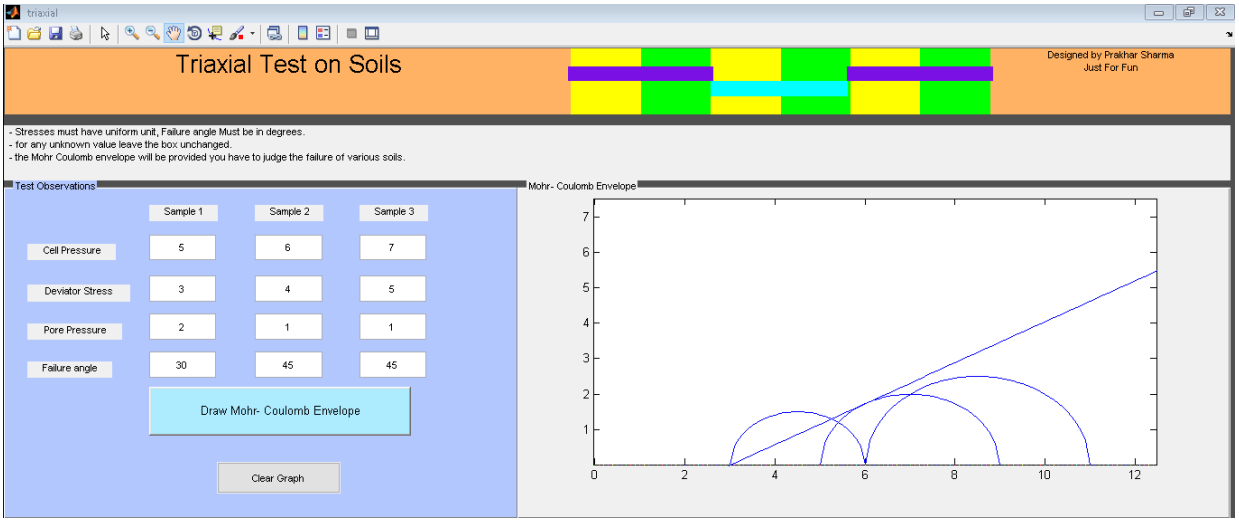
- Draw Curve pushbutton

```
function pushbutton3_Callback(hObject, eventdata, handles)
q=str2num(get(handles.Q,'String'));
z=str2num(get(handles.Z,'String'));
i=str2num(get(handles.I,'String'));
f=str2num(get(handles.Fi,'String'));
x=i:(f-i)/20:f;
sigy=3*q/2/pi*z.^3*(x.^2+z.^2).^(-2.5);
axes(handles.graph)
xlabel=('Radial Distance in m');
ylabel=('Stress in kN/sqm');
plot(x,3*q/2/pi*z.^3*(x.^2+z.^2).^(-2.5),x,q/pi*z*(2*x.^2+z.^2).^(-1.5));
hleg1=legend('Bousinessq','Westergaard');
guidata(hObject.handles);
```

- Calculate pushbutton

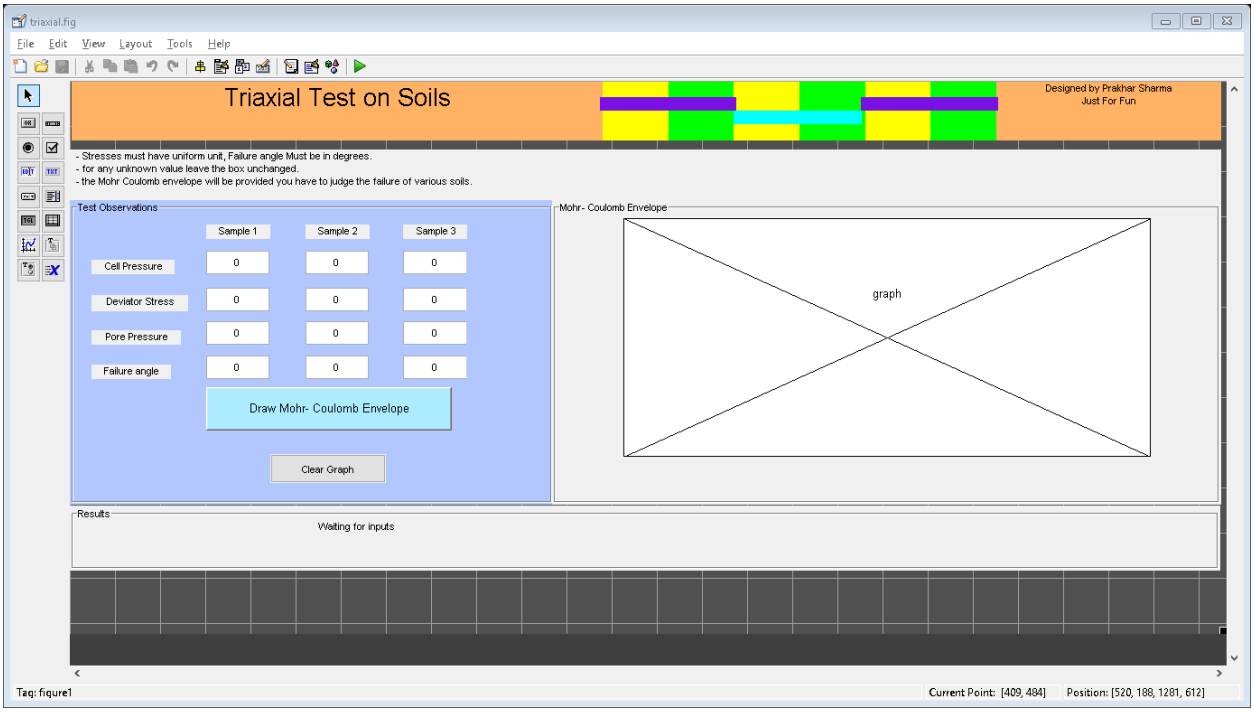
```
function pushbutton4_Callback(hObject, eventdata, handles)
q=str2num(get(handles.Q,'String'));
z=str2num(get(handles.Z,'String'));
x=str2num(get(handles.R,'String'));
sigb=3*q/2/pi*z.^3*(x.^2+z.^2).^(-2.5);
sigw=q/pi*z*(2*x.^2+z.^2).^(-1.5);
set(handles.TV_B,'String',num2str(sigb));
set(handles.TV_W,'String',num2str(sigw));
```

2) Mohr Coulomb Envelope for Tri-axial Test



Screenshot of GUI

(A) Figure File

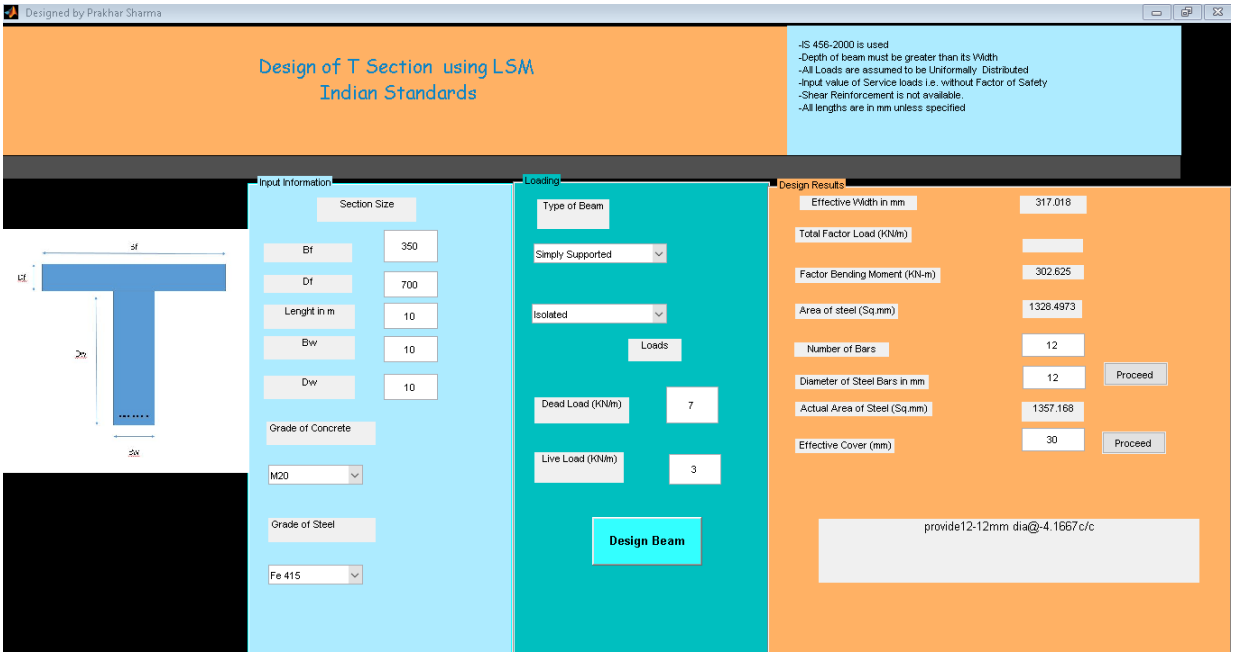


(B) .m File (only main pushbutton)

```
function pushbutton1_Callback(hObject, eventdata, handles)

sS31=str2num(get(handles.s31,'String'));
sS32=str2num(get(handles.s32,'String'));
sS33=str2num(get(handles.s33,'String'));
sSd1=str2num(get(handles.sd1,'String'));
sSd2=str2num(get(handles.sd2,'String'));
sSd3=str2num(get(handles.sd3,'String'));
Su1=str2num(get(handles.u1,'String'));
Su2=str2num(get(handles.u2,'String'));
Su3=str2num(get(handles.u3,'String'));
sT1=str2num(get(handles.t1,'String'));
sT2=str2num(get(handles.t2,'String'));
sT3=str2num(get(handles.t3,'String'));

sS31=sS31-Su1;
sS32=sS32-Su2;
sS33=sS33-Su3;
sS11=sSd1+sS31;
sS12=sSd2+sS32;
sS13=sSd3+sS33;

axes(handles.graph)
x=sS31:0.1:sS11;
set(gca,'DataAspectRatio',[1 1 1]);
title('Mohr Coulomb Envelope');
```

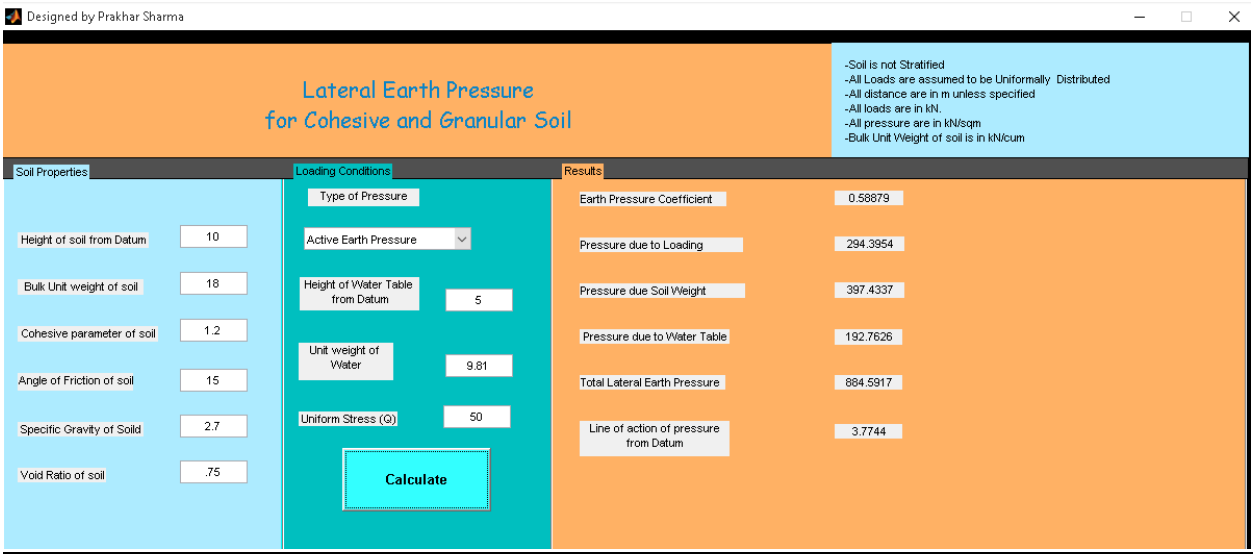
```
xlabel('Normal Stress');
ylabel('Shear Stress');
plot(x,sqrt(((sS11-sS31)/2).^2-(x-(sS11+sS31)/2).^2));
hold on
x=sS32:0.1:sS12;
plot(x,sqrt(((sS12-sS32)/2).^2-(x-(sS12+sS32)/2).^2));
hold on
x=sS33:0.1:sS13;
plot(x,sqrt(((sS13-sS33)/2).^2-(x-(sS13+sS33)/2).^2));
hold on
S1=((sS11+sS31)/2+(sS11-sS31)/2*cosd(2*sT1));
T1=(sS11-sS31)/2*sind(2*sT1);
phi=(45-sT1)*2;
c=T1-S1*tand(phi);
x=-5:.1:20;
plot(x,c+x*tand(phi));
plot(x,0);
guidata(hObject.handles);
```

(3) Design of T section using LSM



Screenshot of GUI

(4) Lateral Earth Pressure due to backfilling



Thank You