simplest form that will produce ok results:

```
function XTV = mytvreg(A,b,x0,alpha,beta)

options = optimset('Display' , 'iter');
f = @(x)fcost(x,A,b,beta,alpha);
XTV= fminunc(f,x0,options);
```

you will need to also write the cost function

```
function f = fcost(x,A,b,beta,alpha)
f = norm(A*x-b)^2 +   ... ; % here add the TV regularization term
```

---

more sophisticated version that will produce very good results - you need to provide also the gradient of the cost function

```
function XTV = mytvreg(A,b,x0,alpha,beta)

options = optimset('Display' , 'iter');
options = optimset(options,'GradObj','on');
f = @(x)fcost(x,A,b,beta,alpha);
XTV= fminunc(f,x0,options);
```

you will need to write the cost function that returns both the value of the cost function and its gradient

```
 function [f,gradf] = fcost(x,A,b,beta,alpha)
f = norm(A*x-b)^2 +   ... ; % here add the TV regularization term

gradf = 2*A'*(A*x-b) + ... % here add the corresponding TV gradient, see notes
```