


# How to Freeze and Unfreeze an Animation and Maintain Time Continuity



Oregon State University  
Mike Bailey  
mjb@cs.oregonstate.edu

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FreezeAnimation.cpp

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## At the Top of the Program:

```
const int MS_PER_CYCLE = 10000; // 10000 milliseconds = 10 seconds
float TimeFrozen; // when animation was frozen
float TimeUnfrozen; // when animation was unfrozen
float TimeElapsed; // how much time elapsed between freezing and unfreezing
```

### In Reset():

```
TimeElapsed = 0.f;
```




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## In Keyboard()

```
case 'T':
case 'F':
    Freeze = !Freeze;
    if( Freeze )
    {
        glutIdleFunc(NULL);
        TimeFrozen = Time - TimeElapsed;
        if( TimeFrozen < 0. )
            TimeFrozen = TimeFrozen + 1.f; // wrap-around
    }
    else
    {
        glutIdleFunc(Animate);
        int ms = glutGet(GLUT_ELAPSED_TIME);
        ms %= MS_PER_CYCLE; // the value of ms is between 0 and MS_PER_CYCLE-1
        Time = ((float)ms / (float)MS_PER_CYCLE); // makes the value of Time [0., 1.)
        TimeUnfrozen = Time;
        TimeElapsed = TimeUnfrozen - TimeFrozen;
        if( TimeElapsed < 0. )
            TimeElapsed = TimeElapsed + 1.f; // wrap-around
    }
    break;
```



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## When Drawing

```
float time = Time - TimeElapsed;
if( time < 0. )
    time = time + 1.f; // wrap-around
```

When drawing, now use *time* in the same way you used *Time* before. For example:

```
glRotatef( 360.f * time, 0., 1., 0. );
or
float y = Amplitude * sinf( 2.f * F_PI * time );
```



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