**Using Python with Google Earth API COM, few examples**

**Requires:** Python, [pywin32 module](http://sourceforge.net/project/showfiles.php?group_id=78018), Google Earth must be installed

* **Connecting to the** [**Google Earth API COM**](http://earth.google.com/comapi/index.html) **(on Windows):**

import win32com.client, time  
  
ge =  win32com.client.Dispatch("GoogleEarth.ApplicationGE")  
while not googleEarth.IsInitialized():  
    time.sleep(0.5)  
    print "waiting for Google Earth to initialize"

* **Move the camera to a given latitude, longitude, altitude, tilt and azimuth**

latitude=41.487942                            # Latitude in degrees. Between -90 and 90.  
longitude=-81.6865                            # Longitude in degrees. Between -180 and 180.  
altitude=1000                                     # in meters  
tilt=0                                                 # looking to the horizon=90, looking to the center of Earth=0  
azimuth=370                                     # looking North=0, East=90, South=180, West=270  
speed=0.5                                         # speed transition. must be >= 0, above 5.0 the transition is instantaneous  
range=0                                            # If not=0 camera will move backward from "range meters along the camera axis   
altMode=1                                           #Altitude mode that defines altitude reference origin (1=above ground, 2=absolute)  
  
  
ge.[SetCameraParams](http://earth.google.com/comapi/interfaceIApplicationGE.html#9e1c8da5b36e8687fe718f2267224103) (latitude, longitude, altitude, altMode, focusDistance, tilt, azimuth, speed)

* **Get some informations about the camera now (position,angles ...)**

cam=googleEarth.[GetCamera](http://earth.google.com/comapi/interfaceIApplicationGE.html#35de839b3824f5be4ef13bdff27786d3)(True)       # returns a [ICameraInfoGE](http://earth.google.com/comapi/interfaceICameraInfoGE.html)  object  
  
print cam.FocusPointLatitude                  # gives the latitude of the cam if the cam is looking down at the vertical  (otherwise gives the Latitude of the focus point on the Earth in degrees?)  
print cam.FocusPointLongitude                # same for longitude  
print cam.Tilt                                           #give the tilt value of the cam  
print cam.Azimuth                                   # give the azimuth value

* **Open an existing kml file on your PC**

ge.[OpenKmlFile](http://earth.google.com/comapi/interfaceIApplicationGE.html#0c3cf6e34051aab573a7fb82eb3f4a41) (path,True) #where path is the absolute path (using "/"s) of the file on your PC

* **Bits and bobs, tests:**

###############################################################################  
# pyGEtools - Draft/examples/bits and bobs (public domain)  
# Control Google Earth through its API COM interface  
###############################################################################  
  
import win32com.client, time  
from math import \*  
  
##Some default global variables  
# Default Latitude in degrees. Between -90 and 90.  
latitude=48.583106   
# Default Longitude in degrees. Between -180 and 180.  
longitude=7.751436   
# Default altitude in meters  
altitude=10000 # in meters  
# looking to the horizon=90, looking to the center of Earth=0  
tilt=0  
# looking North=0, East=90, South=180, West=270  
azimuth=370   
# speed transition. must be >= 0, above 5.0 the transition is instantaneous  
speed=5  
# If not=0 camera will move backward from "range meters along the camera axis   
range=0  
#Altitude mode that defines altitude reference origin (1=above ground, 2=absolute)  
altMode=2  
  
def ge\_connect():  
    """ Open communication with Google Earth and start GE if necessary"""  
    global GE  
    GE =  win32com.client.Dispatch("GoogleEarth.ApplicationGE")  
    while not GE.IsInitialized():  
        time.sleep(0.5)  
        print ">>> Waiting for Google Earth to initialize."  
    print ">>>> Connection established."  
      
def ge\_setCamera():  
    """ Set the camera to a given place, altitude and viewing angles """  
    GE.SetCameraParams( latitude, longitude, altitude, altMode,range,tilt, azimuth, speed)  
  
def ge\_getCameraInfo():  
    """ Get some informations about the camera"""  
    cam=GE.GetCamera(False)  
    camInfos={}  
    camInfos["focusPointLatitude"]=cam.FocusPointLatitude  
    camInfos["focusPointLongitude"]=cam.FocusPointLongitude  
    camInfos["focusPointAltitude"]=cam.FocusPointAltitude  
    camInfos["focusPointAltitudeMode"]=cam.FocusPointAltitudeMode  
    camInfos["range"]=cam.Range  
    camInfos["tilt"]=cam.Tilt  
    camInfos["azimuth"]=cam.Azimuth  
    # compute camera altitude (doesn't work if tilt is very near to 90 degrees)  
    camInfos["altitude"]=(cam.Range)\*cos(cam.Tilt\*(2\*pi)/360)  
    #experiment  
    cam.Azimuth=10  
    print ">>> Setting camera now"  
    GE.setCamera(cam,1)  
    print camInfos  
    return camInfos  
  
def ge\_cam\_go\_diffazimuth(angle,speed=1):  
    """   
    Change camera azimuth by angle value (degrees)   
    angle can be postitive or negative  
    """  
    cam=GE.GetCamera(False)  
    cam.Azimuth+=angle  
    GE.setCamera(cam,speed)  
      
def ge\_cam\_go\_azimuth(angle,speed=1):  
    """   
    Rotate camera to azimuth angle (degrees)   
    """  
    cam=GE.GetCamera(False)  
    cam.Azimuth=angle  
    GE.setCamera(cam,speed)  
  
def ge\_cam\_go\_difftilt(angle,speed=1):  
    """   
    Change camera tilt by angle value (degrees)   
    angle can be postitive or negative  
    """  
    cam=GE.GetCamera(False)  
    cam.Tilt+=angle  
    GE.setCamera(cam,speed)  
      
def ge\_cam\_go\_tilt(angle,speed=1):  
    """   
    Rotate camera to tilt value (degrees)   
    """  
    cam=GE.GetCamera(False)  
    cam.Tilt=angle  
    GE.setCamera(cam,speed)  
      
def ge\_cam\_go\_diffrange(length,speed=1):  
    """   
    Change camera rangge by angle value (degrees)   
    angle can be postitive or negative  
    """  
    cam=GE.GetCamera(False)  
    cam.Range+=length  
    GE.setCamera(cam,speed)  
      
def ge\_cam\_go\_range(length,speed=1):  
    """   
    Change camera rangge by angle value (degrees)   
    angle can be postitive or negative  
    """  
    cam=GE.GetCamera(False)  
    cam.Range=length  
    GE.setCamera(cam,speed)  
  
def ge\_cam\_rotate(azimuth=None,tilt=None,diffazimuth=0,difftilt=0):  
    pass  
  
def ge\_cam\_diffrotate():  
    pass   
      
def ge\_cam\_difflook(difflatitude=0,difflongitude=0,speed=1):  
    """ Looks like it doesn't work if tilt=0 """  
    cam=GE.GetCamera(False)  
    cam.FocusPointLatitude+=difflatitude  
    cam.FocusPointLongitude+=difflongitude  
    GE.setCamera(cam,speed)   
      
def ge\_getLocation():  
    loc=GE.GetPointOnTerrainFromScreenCoords(0,-1)  
    print loc.Latitude  
  
def ge\_loadKmlData():  
    """ Load kml data from a string"""  
    #Don't add all the kml header => pywintypes errors  
    data="""  
    <kml>  
      <Placemark>  
    <name>Simple placemark</name>  
    <description>Attached to the ground. Intelligently places itself   
       at the height of the underlying terrain.</description>  
    <LookAt>  
            <longitude>-122.0822035425683</longitude>  
            <latitude>37.42228990140251</latitude>  
            <range>1000</range>  
            <tilt>0</tilt>  
            <heading>0</heading>  
    </LookAt>  
    <Style>  
            <IconStyle>  
                <Icon>  
                    <href>http://farm2.static.flickr.com/1233/1434233189\_7137633b87\_b.jpg</href>  
                </Icon>  
            </IconStyle>  
        </Style>  
    <Point>  
      <coordinates>-122.0822035425683,37.42228990140251,0</coordinates>  
    </Point>  
    </Placemark>  
    </kml>  
    """  
    GE.LoadKmlData(data)  
       
      
def ge\_openKmlFile():  
    """ Open an existing kml file by giving the full path with /s """  
    GE.OpenKmlFile("C:/Users/franz/Desktop/pyGEtools/test.kml",False)  
      
if \_\_name\_\_=="\_\_main\_\_":  
    ge\_connect()      
      
    #ge\_cam\_diff\_azimuth(-10)  
    #ge\_cam\_diff\_tilt(-10)  
    #ge\_cam\_diff\_range(-100000)  
      
    ge\_cam\_difflook(difflatitude=1.1,difflongitude=1.1,speed=5)  
      
    #ge\_getCameraInfo()          
    #ge\_openKmlFile()  
    #ge\_loadKmlData()  
    #ge\_getLocation()  
    #ge\_getCameraInfo()  
      
   