Subject: PROPOSAL: linear Scaler helper for different min/max domains
Posted by kohait00 on Wed, 01 Dec 2010 09:19:03 GMT
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hey all

often one ends up using the same pattern over and over again for traversing from i.e. pixel domain (Draw in Ctrl) to the representative Value domain, and back to notify on user action..its a nightmare

what about this one? its a *linear* scaler..

```
template<class T = double>
class Scaler
{
public:
 Scaler() : mn(0), mx(0) {}
 Scaler(const T& mn, const T& mx) : mn(mn), mx(mx) {}

 inline void Min(const T& t) { mn = t; }
 inline T Min() const { return mn; }
 inline void Max(const T& t) { mx = t; }
 inline T Max() const { return mx; }
 inline void MinMax(const T& _mn, const T& _mx) { mn = _mn; mx = _mx; }

 //scales local dimension value t to foreign dimensions d
 //returned in foreign dimension
 inline T To(const Scaler& d, const T& t) { return (t-mn)*(d.mx-d.mn)/(mx-mn)+d.mn; }
 //scales foreign dimension value t from foreign s to local dimension
 //return in local dimension
 inline T From(const Scaler& s, const T& t) { return (t-s.mn)*(mx-mn)/(s.mx-s.mn)+mn; }

 inline T operator() (const Scaler& s, const T& t) { return From(s, t); }
protected:
 T mn, mx;
};
```

using it like this (v for value domain, p for pixel domain)
here only for x axis i.e.

```
 Scaler<double> vsx, psx;

//from draw domain to value domain
 valx = vsx(psx, Point().x);
```

```
//from value domain to draw domain
 Point().x = (int) psx(vsx, valx);
```

i think also of type conversions to be able to convert scaler to scaler with different types..
trying to avoid virtualisation here, but thinking of a logarithmic scaler as well, but then probably would need to virtualize an interface.

any hints / improvements welcome

Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by kohait00 on Wed, 01 Dec 2010 09:28:20 GMT
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i've got a test 'suite' for the Scaler, actualle a positioning control with veeery basic look. maybe this could be extended somehow to be helpful in Upp..

attached is the Test environment

File Attachments
1) PosCtrlTest.rar, downloaded 217 times

Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by koldo on Wed, 01 Dec 2010 14:54:36 GMT
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Hello Kohait

This could be other focus, perhaps more algebraic . Just a draft:

```
class Function2D {
 virtual double GetX(double y) {};  // Get the first value
 virtual double GetY(double x) {};
 virtual Array <double> GetX(double y) {}; // Get all values
 virtual Array <double> GetY(double x) {};
};

class Line : public Function2D {
private:
 Point p1, p2;

public:
 Line(Point p1, Point p2) : p1(p1), p2(p2) {};
```

```
 virtual double GetX(double y);
 virtual double GetY(double x);
};

class Polynomial : public Function2D {
public:
 Polynomial(Point p1, ...); // Polynomial defined by points
 Polynomial(double coeff, ...); // Polynomial defined by coefficients
};

... other functions ...
```

Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by dolik.rce on Wed, 01 Dec 2010 15:08:36 GMT
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Good idea Kohait, I spend a lot of time debugging broken scaling in my apps A reliable class to use repeatedly would probably save a lot of time, work and code. I would use this e.g. in PlotCtrl.

I would prefer little bit different interface, I somehow don't like the idea that I need two scalers to perform any conversion. I understand that you were aiming for a universal tool that can be used to convert even between multiple scales (lets think px,pt,cm,m,...), but in simple cases (e.g. I know I only need to convert px<->cm) it adds complexity... Maybe such simpler interface could be made by using class with two Scalers, that would only hide the detail of using two of them.

Best regards,
Honza

Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by kohait00 on Wed, 01 Dec 2010 15:33:38 GMT
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combining 2 of them into a bi-domain is a good idea...let's think on how to expose the iface

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Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by mirek on Wed, 01 Dec 2010 16:19:51 GMT
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What about Xform2D? I guess it is the complete solution to the problem of 2D transformations... (at least for doubles).

Well, perhaps I should move it from Painter to Core?

Mirek

Subject: Re: PROPOSAL: linear Scaler helper for different min/max domains
Posted by kohait00 on Wed, 01 Dec 2010 16:30:08 GMT
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well, i think it's not quite the same, it's a 2D transformation facility, with, translation, rotation, sheer, scale...etc..which is good to have btw..didn't know that

but maybe one could setup a transformation matrix (Xform2D) to transform from one domain (i.e. view) to host domain (value), in the matrix, min and max values would find their place...

i'll take a look..need some math