

MATH-529 – Fundamentals of Optimization

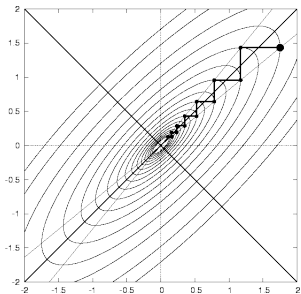
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Mathematical Sciences, University of Delaware, USA

- Postdoctoral researcher at the Math Department since August 2011.
- PhD student until July 2011 at the *Université libre de Bruxelles*, Brussels, Belgium.
- Work on a branch of artificial intelligence with applications in optimization.
- Like learning history.

About the course

minimize $f(x)$
 $x \in \mathbb{R}$



```
Wsize = 48; sigma_d = 5;
gd = fspecial('gaussian', [Wsize+1 Wsize+1], sigma_d);
%another way of generating Gaussian
%[gdX, gdY] = meshgrid(-Wsize/2:Wsize/2, -Wsize/2:Wsize/2);
%gd = 1/(2*pi*sigma_d^2)*exp(-(gdX.^2+gdY.^2)/(2*sigma_d^2));
%figure, surf(gd);
sigma_r = 40;

(0)
for i=1:1:m1
    for j=1:1:n1
        %apply bilateral to R,G,B separately
        for k=1:1:d1
            %get the computation region, considering the boundaries
            Xst = max(1, j-Wsize/2);
            Xed = min(m1, j+Wsize/2);
            Yst = max(1, i-Wsize/2);
            Yed = min(m1, i+Wsize/2);
            IRegion = I1(Yst:Yed, Xst:Xed, k);
            %generate Gaussian filter based on intensity differences
            gr = 1/(2*pi*sigma_r^2)*exp(-(IRegion-I1(i, j, k)).^2);
            gr = gr./sum(gr(:));
            %figure, surf(gr);
            %get the bilateral filter coefficients
            Bco = gd((Yst:Yed)+Wsize/2-i+1, (Xst:Xed)+Wsize/2-j+1);
            %compute the value for filtered pixel
            Ilibase(i, j, k) = sum(sum(Bco.*IRegion))/sum(Bco(:));
        end
    end
end
end
%for debug: show the bilateral filtered image
```

Meetings & Contact

Instructor: Dr. Marco A. MONTES DE OCA

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<https://sakai.udel.edu/portal/>

Office hours: Tuesdays 3:00pm–5:00pm or by appointment

Meetings: Mondays and Wednesdays 3:35pm–4:50pm, 330 Purnell Hall

The final grade components are: Homeworks, Exams, and a Project.

The contribution of each component is as follows:

Component	Weight
Homeworks	40%
Exam 1	10 %
Exam 2	10 %
Final Exam	20 %
Project	20 %

Questions?