

```
In [7]: using Distributions, Plots, GeometryBasics, VoronoiCells
        default(size=(800,600))
```

```
In [8]: lambda_c=50.0
        lambda_a=5.0

        area_a = 4;

        Na = 20#rand(Poisson(lambda_a*area_a))

        xa = rand(Uniform(-1,1),Na,2)

        Nc = 200#rand(Poisson(lambda_c*area_a))
        xc = rand(Uniform(-1,1),Nc,2);
```

```
In [9]: d(x,y) = sqrt(sum((x-y).^2))
        W = [d(xa[i,:],xc[j,:]) for i=1:Na,j=1:Nc]

        attaches = zeros(Nc)

        for j=1:Nc
            _,idx = findmin(W[:,j])
            attaches[j] = idx
        end
        attaches=Int64.(attaches);
```

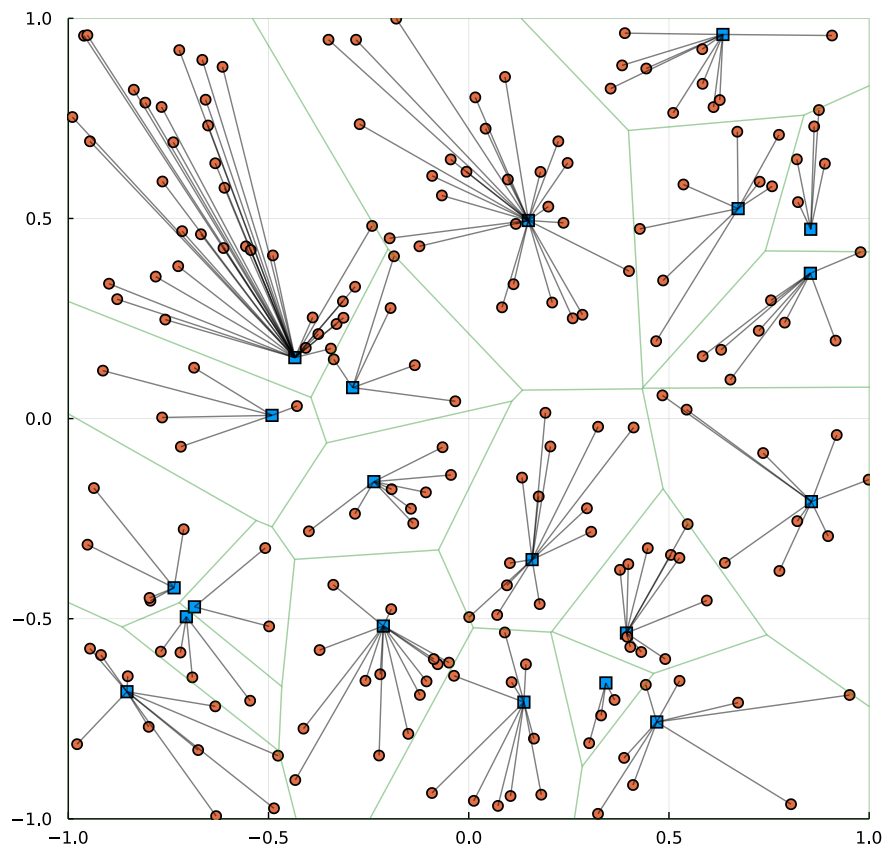
```
In [10]: rect = Rectangle(Point2(-1.0, -1.0), Point2(1.0, 1.0))
        Xa = Point2{Float64}[]
        for i=1:size(xa,1)
            aux = Point2(xa[i,1],xa[i,2])
            push!(Xa,aux)
        end
        tess = voronoiCells(Xa, rect);

        scatter(xa[:,1],xa[:,2], xlims=(-1,1), ylims=(-1,1), aspectratio=:equal, ma
        scatter!(xc[:,1], xc[:,2], legend=:none, colorbar=:none)

        for i=1:Nc
            plot!([xc[i,1],xa[attachs[i],1]], [xc[i,2],xa[attachs[i],2]], color=:bl
        end

        plot!(tess, alpha=0.2, color=:green)
```

Out[10]:

In [11]: **using** JuMP, Gurobi

```

n=size(xa,1)
m=size(xc,1)

model = JuMP.Model(Gurobi.Optimizer)

@variable(model, pi[1:m, 1:n] >= 0)

@constraint(model, sum(pi, dims=2) .== ones(m))
@constraint(model, sum(pi, dims=1) .<= 12 * ones(1, n))

@objective(model, Min, sum(pi .* W'))

optimize!(model)

sol = value.(pi)

for i=1:Nc
    _, idx = findmax(sol[i, :])
    attaches[i] = idx
end

attachs = Int64.(attachs);

```

Set parameter Username
 Academic license - for non-commercial use only - expires 2022-05-16
 Gurobi Optimizer version 9.5.1 build v9.5.1rc2 (linux64)
 Thread count: 4 physical cores, 8 logical processors, using up to 8 threads
 Optimize a model with 220 rows, 4000 columns and 8000 nonzeros
 Model fingerprint: 0x5ec20b6e
 Coefficient statistics:
 Matrix range [1e+00, 1e+00]
 Objective range [1e-02, 2e+00]
 Bounds range [0e+00, 0e+00]
 RHS range [1e+00, 1e+01]
 Presolve time: 0.00s
 Presolved: 220 rows, 4000 columns, 8000 nonzeros

Iteration	Objective	Primal Inf.	Dual Inf.	Time
0	5.1652859e+01	4.1000000e+01	0.0000000e+00	0s
75	5.9422850e+01	0.0000000e+00	0.0000000e+00	0s

Solved in 75 iterations and 0.00 seconds (0.00 work units)
 Optimal objective 5.942284958e+01

User-callback calls 113, time in user-callback 0.00 sec

```
In [12]: scatter(xa[:,1],xa[:,2], xlims=(-1,1), ylims=(-1,1), aspectratio=:equal, ma
scatter!(xc[:,1], xc[:,2], legend=:none, colorbar=:none)

for i=1:Nc
    plot!([xc[i,1],xa[attachs[i],1]], [xc[i,2],xa[attachs[i],2]], color=:blue)
end

tess = voronoicells(Xa, rect);
plot!(tess, alpha=0.2, color=:green)
```

Out[12]:

