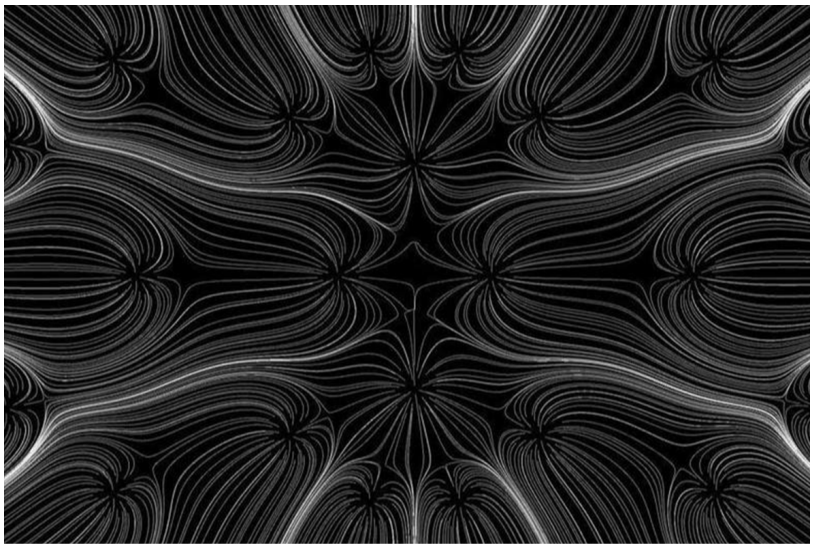
Taubman College of Architecture and Urban Planning | University of Michigan | Fall 2023
ARCH 509 – Computational Design | Dr. Mania Aghaei Meibodi |https://dartlab.umich.edu/ |
Wednesdays 8:30 am - 11:30 am | 3136 A&AB



```
tweenCrvList = []
for srf in crvList:
    #cent = ghcomp.Area(srf)[1]
    interval = rg.Interval(0.0,1.0)
    srf.SetDomain(0,interval)
    srf.SetDomain(1,interval)
    u = random.uniform(0.1,0.9)
    v = random.uniform(0.1,0.9)
    cent = srf.PointAt(u,v)


    edge = ghcomp.BrepEdges(srf)[0]
    joined = ghcomp.JoinCurves(edge,True)
    divRnd1 = random.uniform(4,12)
    divCrv1 = ghcomp.DivideCurve(joined,divRnd1,False)[0]
    divRnd2 = random.uniform(6,15)
    divCrv2 = ghcomp.DivideCurve(joined,divRnd2,False)[0]
    pts1 = []
    pts2 = []
    for pt in divCrv1:
        rnd = random.uniform(0.6,1.0)
        evalPt1 = pointOn(pt,cent,rnd)
        pts1.append(evalPt1)

    for pt in divCrv2:
        rnd2 = random.uniform(0.1,0.3)
        evalPt2 = pointOn(pt,cent,rnd2)
        pts2.append(evalPt2)
    nCrv1 = ghcomp.Interpolate(pts1,3,True,0)[0]
    nCrv2 = ghcomp.Interpolate(pts2,3,True,0)[0]
    domain = rg.Interval(0.0,1.0)
```

ARCH 509 – Computational Design
Introduction to Algorithmic and Computational Design and Research

ARCH 509 – Computational Design introduces the students to algorithmic thinking, algorithmic design, and programming in the context of creative design and architecture. Students will be introduced to the logical procedure, basic computational geometric procedure, and programming fundamentals, such as syntax, variables, functions, arguments, loops, and conditional statements. Through hands-on workshops and assignments, students will investigate text-based programming, visual programming, geometric concepts, and operations. These activities are complimented with reading exercises and discussions around algorithms and computation in design and how they have revolutionized our approach and research. Students will also be introduced to conventions for representing algorithms, such as pseudocode.

The course is primarily structured around a series of lectures by the instructor, hands-on workshops, selected readings, and group discussions, weekly assignments and presentations, a midterm, and a final project. Students will work individually and in groups of two or three. A basic understanding of Rhino is essential for students. They should bring a laptop equipped with Windows, Rhino 7.0, Grasshopper, and necessary software to class. Additionally, the mid and final assignments will involve 3D printing.

This course is also open to doctoral students who can enroll in ARCH 825 – Doctoral Area Seminar-BT. Doctoral students are required to complete a comprehensive research paper in addition to the assigned tasks. Full papers should consist of a minimum of 3,500 words and a maximum of 4,000 words, excluding the abstract, captions, and endnotes.