Portfolio

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Exploring ways to improve the lives of people in developing countries with well designed technological interventions.

Handpicked projects from a more extensive list available on the web.

Avatar – Exploring employment opportunities with real time mobile video streaming.

In Collaboration with: Dr. Bill Thies & Dr. Colin Scott
*Work done as a Research Fellow at Microsoft Research India.*
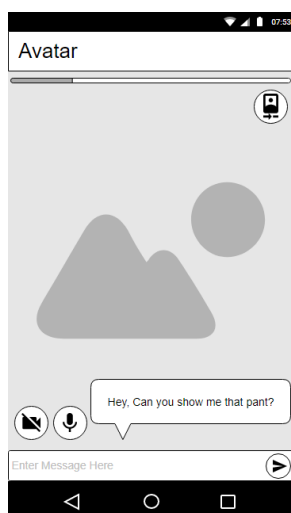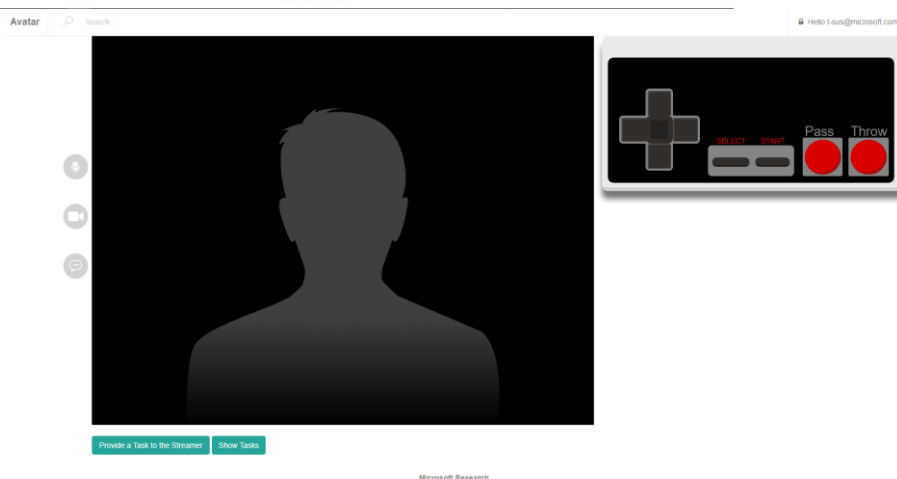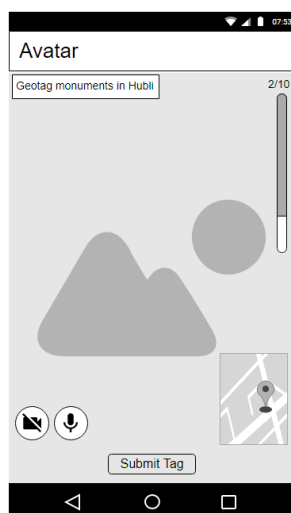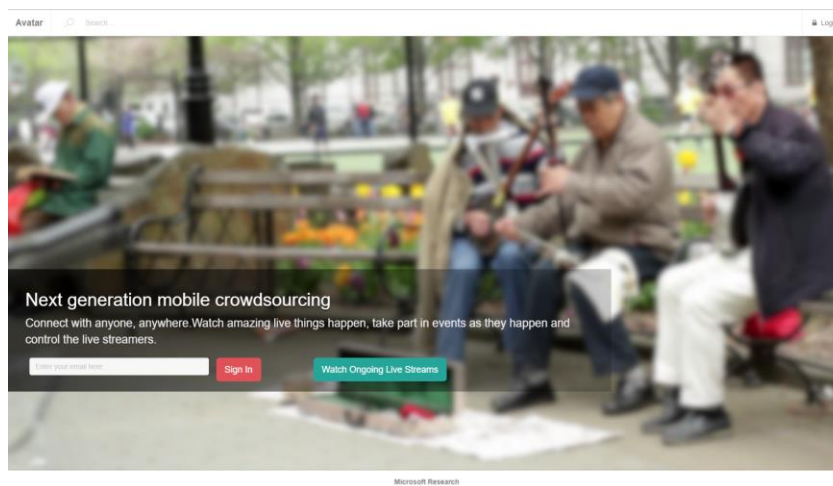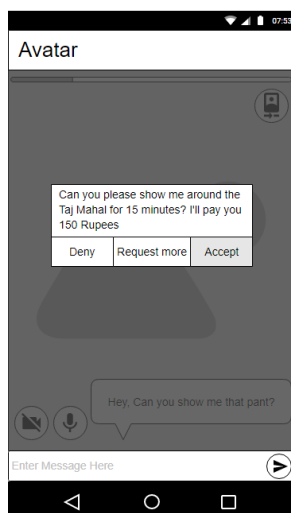
High bandwidth cellular connectivity is becoming highly pervasive in countries like India. Over the last few years the number of smartphones have exponentially increased. There have been extensive studies in the HCI community on remote collaboration and remote experiences. The main research questions we are asking here is:

1. *Can we provide sustainable employment opportunities via mobile video streamed crowdsourcing?*
2. *What kind of interventions and interactions do these video communications enable?*

With Avatar, we aim to provide opportunities for mobile crowd workers to perform tasks with varying skill ranges similar to current crowd sourcing platforms. The Avatar project and its services serve as one of the requirements for implementation of proof of verifiable work in the Vishrambh project.

Vishrambh – Corruption free systems with Blockchain & IndiaStack.

In Collaboration with: Dr. Muthian Sivathanu & Dr. Bill Thies
Work done as a Research Fellow at Microsoft Research India.
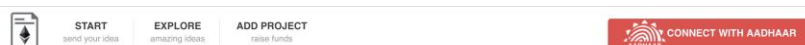
Awards:

❖ Global 3rd place – Public Sector – Microsoft One Week
❖ Winner – Microsoft India Leadership Challenge for Blockchain and #IndiaStack
❖ Winner – Angelhack 10 Bangalore

The main objective of the platform is to build a transparent platform where donors clearly see the impact of their donation and aims to remove corrupt middlemen/NGOs which are used for siphoning money. Going further, the aim of the project is to build a scalable and generic system that can enable processes requiring transparency.

Vishrambh is a DApp that is built on blockchain systems and connected to the unique offering of IndiaStack consisting of Aadhaar, UPI, and Digi locker; built and maintained by the Indian government. The users of the application are classified as donors, beneficiaries, NGO partners and 3rd party partners. The authentication of each of these users happens via Aadhaar and all payments done via the Unified Payments Interface (UPI) are recorded on the blockchain.

The donors donate the money while specifying constraints on how they would like such donations being used. These are encoded into a blockchain understandable smart contract and executed as required giving the full transparent trace of the donation as it reaches the intended beneficiaries.

CloudATM – Improving Accessibility & Usability For ATM Machines.

In Collaboration with: Dr. Colin Scott
*Work done as a Research Fellow at Microsoft Research.*


Microsoft
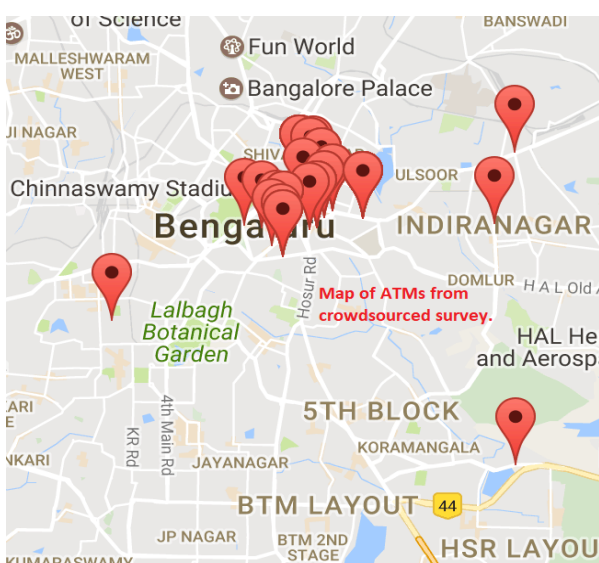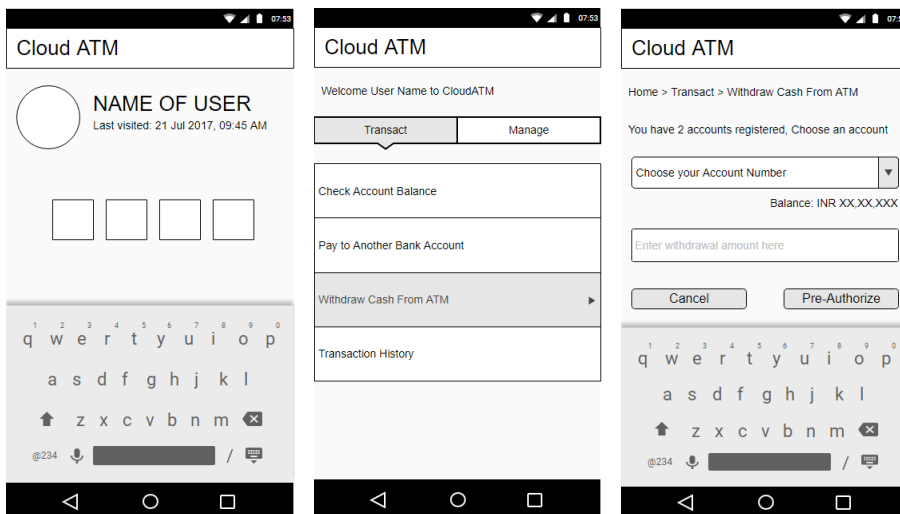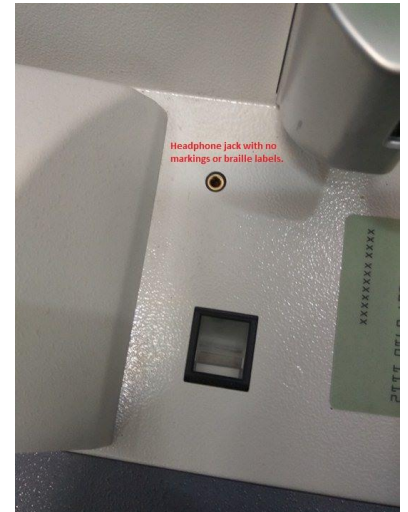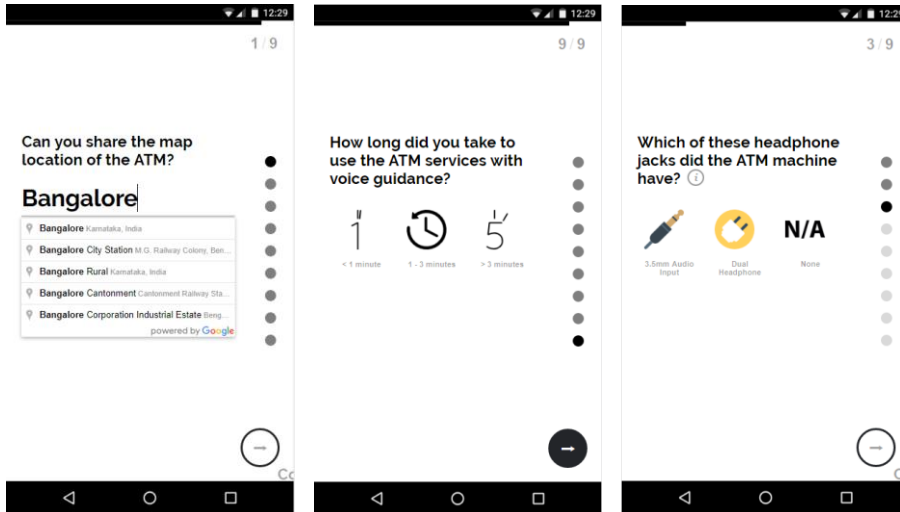
ATM machines and other banking services are not completely accessible to people with visual impairments. The Reserve Bank of India (RBI) which is a governing body mandates that atleast 33% of the ATM machines in the country be accessible to people with impairments. Sadly, the reality is no where close to the targets set by RBI.

The first phase allows users to use a phone app based survey tool to provide accessibility status of the ATMs.

CloudATM is a pre authorization procedure that allows both users without and with accessibility needs to pre authorize a transaction and go to an ATM to collect the money.

Lokole - Ascoderu – Low cost, sustainable IoT device bringing internet access to regions in Africa.

In Collaboration with: Clemens Wolff, Ali Khansari & Nzola
Work done as a Research Fellow at Microsoft Research.
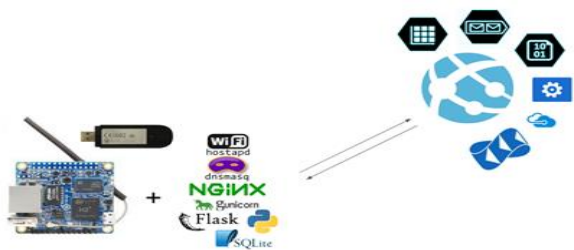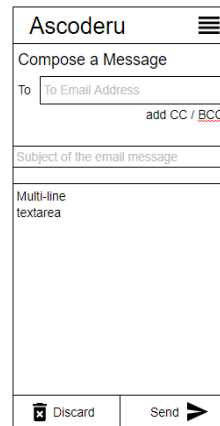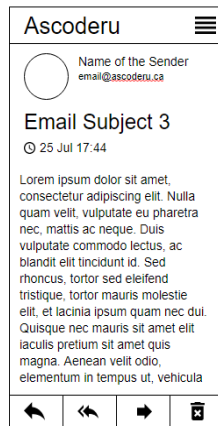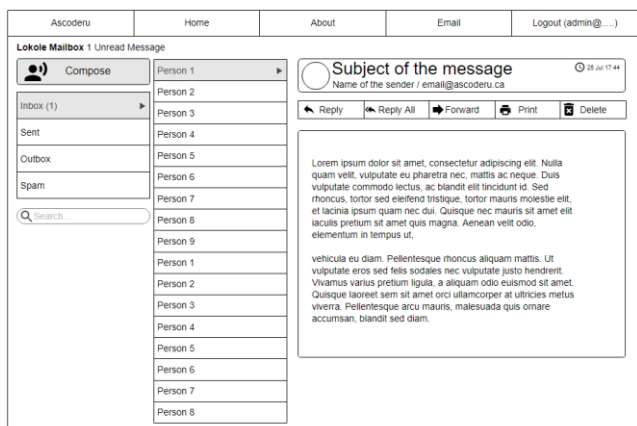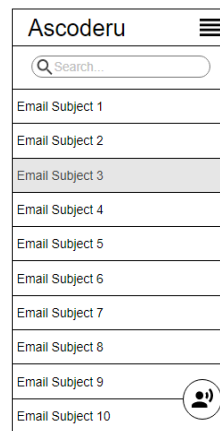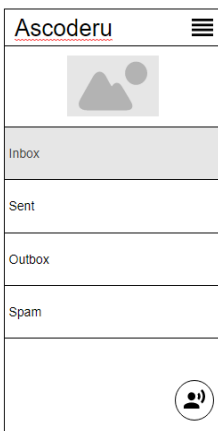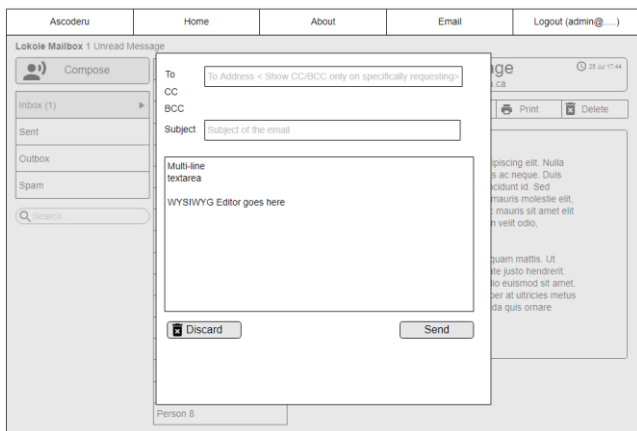
Lokole is a low cost sustainable Internet of Things device that brings batch email access and internet content to developing countries in Africa. Lokole gives 100 people access to email at a price of $1 per day. Rural villagers connect to the nodes' local WiFi network and access communication tools such as a read only internet (provided via satellites in cooperation with ESA) and a smart lokole email server.

My contribution to the project has been in its UI/UX layers for the offline email server that is hosted on the IoT node which allows users to read and write email without having to pay bandwidth costs. This enables doctor, teachers and business via email for a number of users in Africa.

Awards: Most Feasible – Microsoft One Week, Best in Show – Hack for Africa & 3rd place – Microsoft Hack for good.

Loklak – Distributed P2P Micro Message Search Server APIs

In Collaboration with: Michael Peter Christen & Mario Behling
Work done as a student at Google Summer of Code 2016 & 2015.

In Collaboration with:
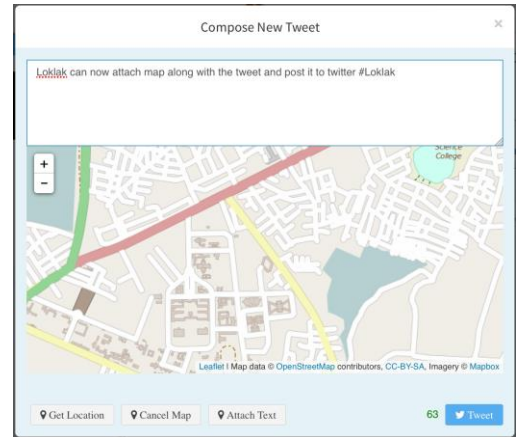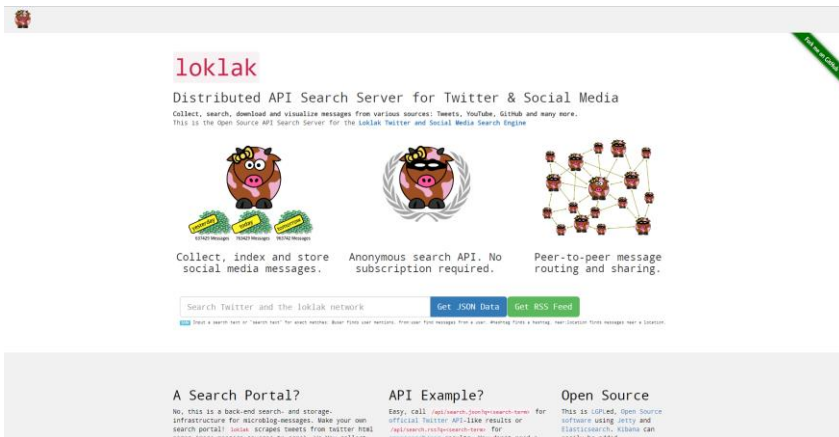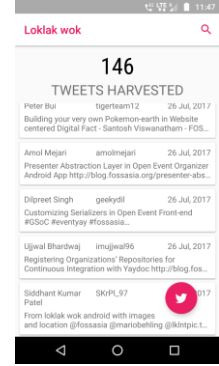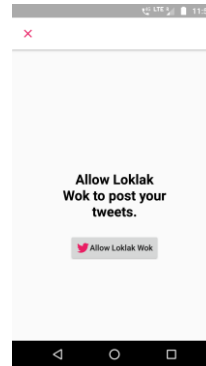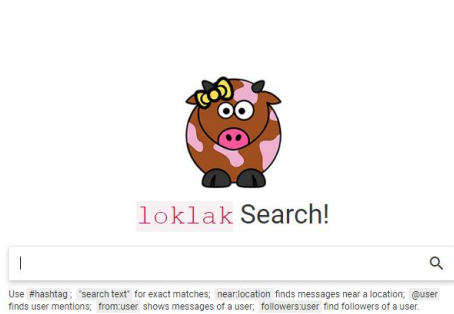
Modern social networks have become sources for vast quantities of data. Having access to such big data can be very useful for various researchers and data scientists. In this paper we describe Loklak, an open source distributed peer to peer crawler and scraper for supporting such research on platforms like Twitter, Weibo and other social networks. Social networks such as Twitter and Weibo pose various limitations to the user on the rate at which one could freely collect such data for research. Our crawler enables researchers to continuously collect data while overcoming the barriers of authentication and rate limits imposed to provide a repository of open data as a service.

Loklak has the ability to scrape and store tweets while crowd sourcing them into one single database and allowing open access to it. The server has been successful in scraping and crawling Twitter and similar social networks and has given rise to a large community of developers and open data enthusiasts using such a system as a direct alternative to the twitter API.

Distributed Mobile Open Playgrounds for Co-Creative Personal Game Design & Experiences.

In Collaboration with: Dr. Colin Scott
*Work done as a Research Fellow at Microsoft Research.*
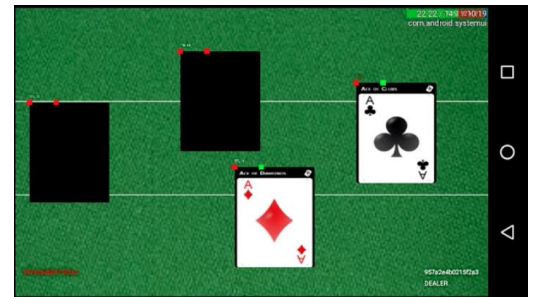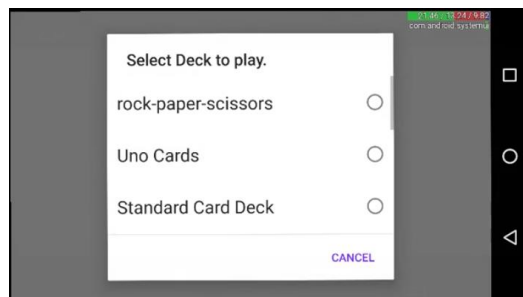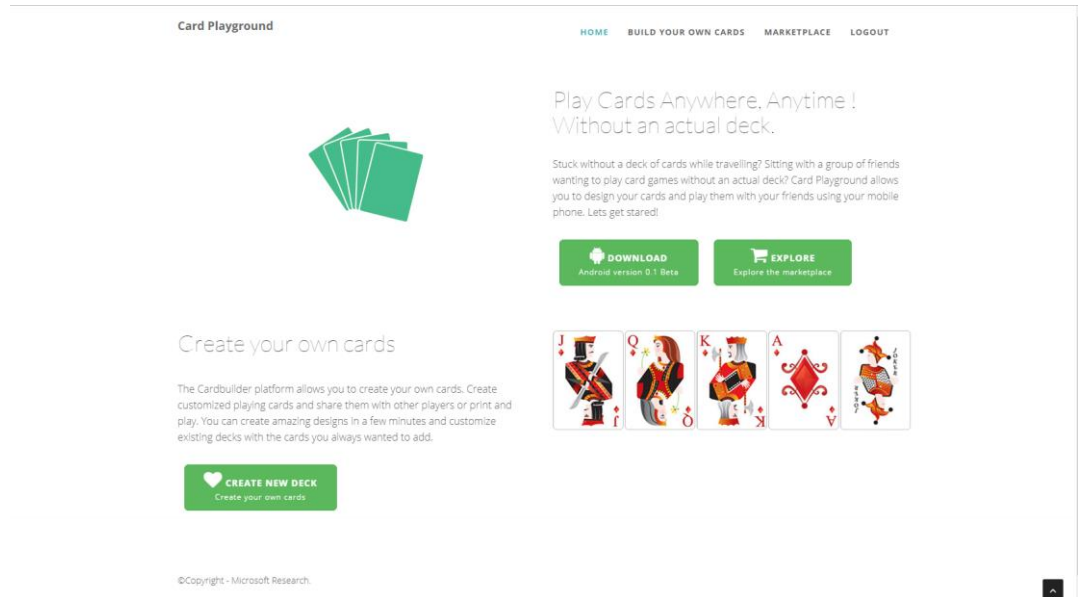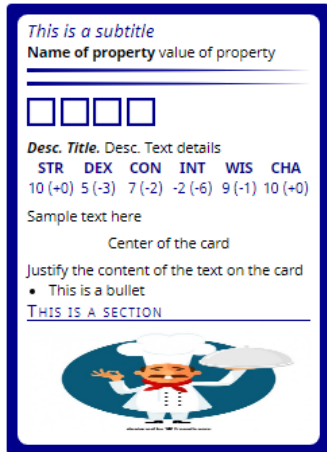
Game experiences today are driven by the designer and the mechanics that are included by them. People sitting in groups enjoy simple card games especially with family and friends. With the current extent of technology, there is a higher chance for a group to carry phones in their pocket than a bunch of board & card games. In this research, we are trying to explore and understand how to empower users with the ability to co-design and control their user experiences in digital games.

We test our hypothesis by building open play ground games i.e. games which do not have any rules and are completely customizable. Sitting on top of the better together toolkit, we built a card playing game and interfaces that allow users to build new cards and share it with others in the card player community. Users can create new card games and play existing card games with different rules. We aim to find out how such a setup of open playground games can result in more engaging and enriching experiences to the players.

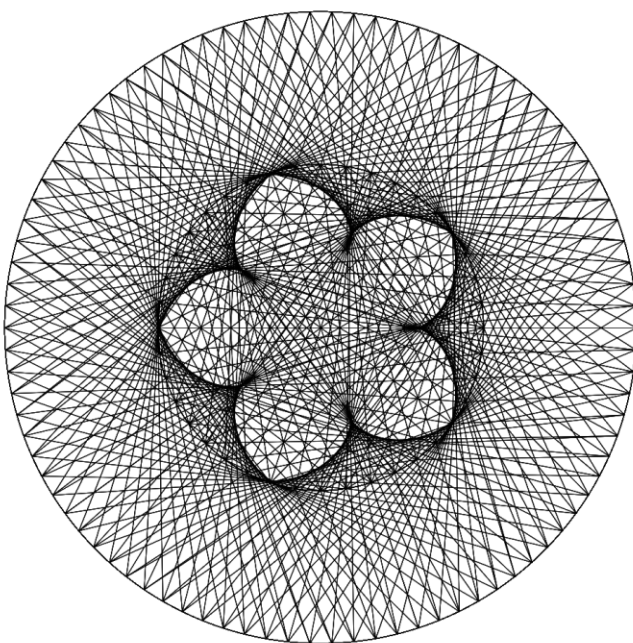# Generative Art – Playing with Circles & Lines

The beauty of mathematics cannot go unnoticed. Generative art and Project Euler provide an opportunity to show the beauty in patterns and how some of the things we see daily are governed by simple yet beautiful mathematical expressions and recursive functions.
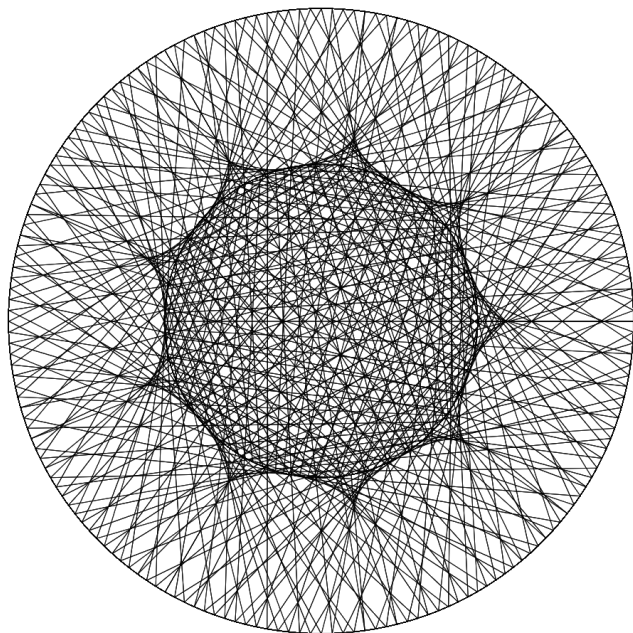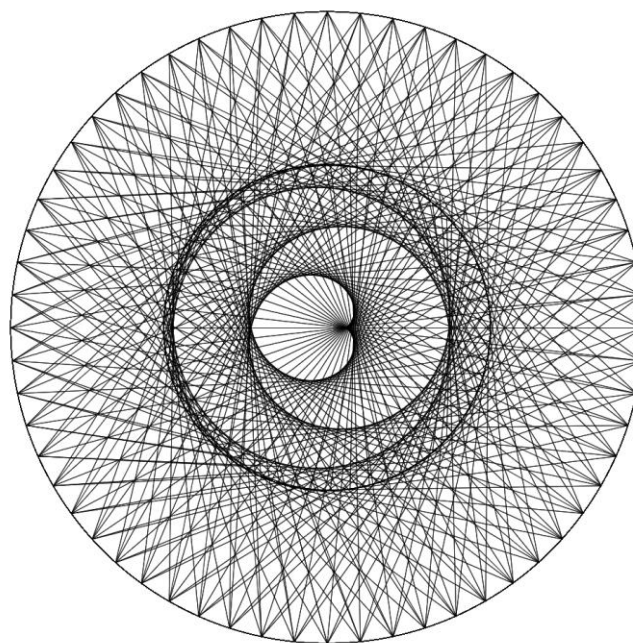
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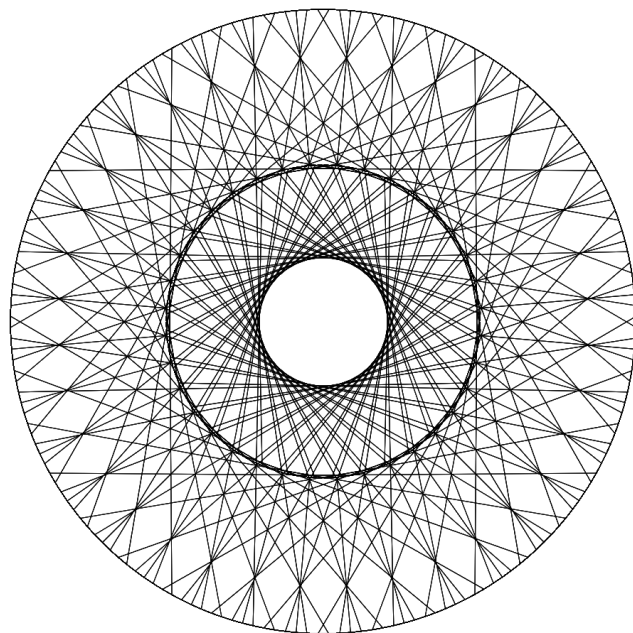
The Eye

The Flower

The Peacock Feather

Thank You!