

NOT-EQUAL

EPSRC Network+: Social Justice through the Digital Economy Pilot Projects: Application Form

We are seeking funding proposals from shortlisted candidates for Not Equal's first call for pilot projects. For full guidance please see details of the call on the Not Equal [website](#).

Pilot research projects can be between 6-8 months in length. We expect to fund up to 12 pilot research projects of up to £40k (80%FEC) for this first funding call.

Please submit this form before the deadline of **5pm, 30th April 2019** to notequal@ncl.ac.uk.

Applicants will be advised on the outcome of their proposal by the 30th May 2019.

GENERAL INFORMATION

Lead Applicant (PI): Sara Heitlinger
Email address: sara.heitlinger@city.ac.uk
Job Title: Lecturer in Computer Science
Department: Computer Science
Organisation: City, University of London

Co-Investigators (names and organisations):

Alex Taylor, City, University of London
Lara Houston, City, University of London

Supporting Partner(s):

Spitalfields City Farm

Furtherfield

Gaia Foundation

Project Title:

Co-designing a sustainable food justice system with blockchain futures

Project Tagline:

Prototyping more-than-human values for the food commons with urban agricultural communities

EOI Reference Number: NE20

1. SUMMARY

Please provide a summary of your proposed research project (<300 words).

The project takes an algorithmic approach to creating a sustainable food justice system. Food justice is a paradigm case for algorithmic justice because it has three clearly defined problems that will be tractable to an algorithmic approach. The first is about the need to create a more-than-human value system, because an exclusive focus on human benefit is driving an unsustainable food system. The second is about finding ways to sustain the food commons because the global corporate food system creates,



through extractions and enclosures, food injustices. Thirdly, we need to ensure that algorithmic approaches are inclusive or we risk intensifying exclusions and inequalities within the food system. The project involves a series of workshops with grassroots urban agricultural communities in London to co-design sustainable food justice futures through blockchain using a speculative participatory design approach that we have developed, tested and synthesised. We will develop blockchain prototypes for what a more-than-human value system for the food commons might look like. We will also develop a method that synthesises best practice for co-designing blockchain solutions with diverse, marginalised and non-technical citizens in order to incorporate inclusivity in our algorithmic approach. We focus on blockchain with its potential to interject in the relations between actors through, for example, tokenisation, smart contracts and distributed autonomous organisations (DAOs), leading to radical regulation and redistribution of power. Such blockchain facets offer the basis for creating new value systems and embedding the interests of non-humans such as seeds, soil and water into algorithmic systems. In these ways the project takes a novel approach to reconfiguring food, blockchain, and values to create more sustainable, inclusive and just futures. Outputs include a website, a printed booklet, and a CHI paper, to raise awareness about, and open up new possibilities for, algorithmic solutions to a sustainable food justice system.

2. HOW DOES YOUR PROPOSAL ALIGN WITH THE THEMES AND OBJECTIVES OF NOT EQUAL?

Please describe how your proposal helps understand, explore or develop practical responses to social justice issues within the digital economy; and how does your proposal enhance a cross-disciplinary way of working. Please also indicate which of the Not Equal challenge areas your proposal focuses on e.g. Algorithmic Social Justice, Digital Security for All and Fairer Futures for Business and Workforce (<500 words).

The project takes an algorithmic approach to creating a sustainable food justice system. We focus on food because it is ripe for algorithmic treatment and has three clearly defined problems that relate to algorithmic justice.

Firstly, we need to create a more-than-human value system, because the exclusive focus on human benefit is driving unsustainable food practices. Intensive agricultural production has failed to acknowledge the ways in which humans and other species are interdependent, and contributed to degraded soils, polluted waterways, the loss of 75% of all cultivated crop diversity (FAO, 2019) and other mass extinctions, ultimately threatening food security for all life on the planet (Willet et al, 2019). We need to find ways of redistributing value and power across nonhuman actors that are being exploited to the point of extinction.

Secondly, we need to find a way to sustain the food commons in order to create food sovereignty and security (Holt-Giménez, 2011). The corporate industrial food system has sought to extract and enclose the planet's resources for profit, concentrating the benefit and power into the hands of a few individuals and multinationals. For example, four seed companies now control more than 60 percent of the global seed market.

Thirdly, we need to ensure that our algorithmic approach is inclusive or we risk intensifying digital exclusions and inequalities. Technological innovations can sustain and amplify existing imbalances within the food system. For example, genetic modification (GM) works towards patenting seed, profiting multinationals by displacing locally-grown and adapted crop varieties and creating farmer dependencies, sometimes with devastating consequences (e.g. farmer suicides in India).



How can we realign and rebalance the structural and economic inequalities within the corporate food system through new algorithmic infrastructures in order to create more sustainable and just food systems?

Against this backdrop of ongoing environmental damage, and its uneven affects and daunting statistics, the project seeks a grounded understanding of how the algorithmic plays into the production and distribution of food. Crucially, our project seeks to explore what the possibilities might be for more sustainable and just ways to achieve food sovereignty and security.

By conducting an exploratory pilot project with urban agricultural communities in London involving a series of co-design workshops and prototyping of blockchain futures for sustainable food justice, the project experiments with alternative configurations of humans and non-humans such as plants, animals and soil, as well as technologies and their infrastructures. Such reconfigurations aim to distribute control and autonomy more evenly, thereby redressing the existing imbalances within the current global corporate food system, and supporting more sustainable, inclusive and equitable futures.

Our approach is cross-disciplinary. We draw on methods from art and design, science and technology studies (STS) and computer science, in order to ensure that the project generates futures that address the call's remit to help critically understand, creatively explore and develop practical responses to social justice issues in the digital economy.

FAO. 2019. The State of the World's Biodiversity for Food and Agriculture, J. Bélanger & D. Pilling (eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. Rome.

Holt-Giménez, Eric. "Food security, food justice, or food sovereignty." *Cultivating food justice: Race, class, and sustainability* (2011): 309-330.

Willett, Walter, et al. "Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems." *The Lancet* 393.10170 (2019): 447-492.

3. CASE FOR SUPPORT

Please describe your proposed projects, including its aims and objectives. This will include the design and method of your project, context, background literature and data to be collected. Please also indicate why is this research important and for whom (<1000 words).

The project explores an algorithmic approach to creating a sustainable food justice system through co-designing blockchain futures with urban agricultural communities in London. Food justice concerns both the structural inequalities and the environmental degradations effected by global corporate food regimes (Holt-Giménez, 2011). It is a paradigm case for algorithmic justice because it presents three clearly defined justice problems as well as incentives to solve them, and is therefore ready for algorithmic treatment.

We need to develop a **more-than-human value system** to decenter the human from its place of privilege and exceptionalism, and redistribute value more evenly throughout the food system. Within the Anthropocene – a new geological era in which human activity is transforming earth systems, accelerating climate change and causing mass extinctions – a human-centred value system is increasingly seen as untenable. A “more-than-human” perspective acknowledges the interdependencies of humans and non-humans (such as soil, other species, water, microorganisms etc) within the web of life.



We also need a way to **sustain the food commons** in order to create food sovereignty because the global corporate system has enclosed and extracted the planet's resources resulting in monopoly concentration. The commons allows resources to be managed sustainably for the benefit of low income, ethnically diverse communities, rather than corporations'.

Finally, we need to ensure that our **algorithmic approach is inclusive** or we risk intensifying digital exclusions and inequalities. There are significant barriers to access and participation for citizen engagement with complex technologies like blockchain (Elsden, 2019). It is important that we find ways of integrating small scale farmers and their needs in the design of algorithmic systems.

The project therefore aims to:

- 1) Develop a more-than-human value system in order to redistribute value more equally between humans and non-humans
- 2) Develop new ways to sustain the food commons in order to manage resources more equitably
- 3) Ensure that our algorithmic approach is inclusive in order to support participation and access for diverse, marginalised citizens

To meet these aims, the project will explore co-designing blockchain prototypes for a more-than-human value system and sustaining the food commons with urban agricultural communities, using an inclusive speculative participatory design approach that we have developed, tested and synthesised. We focus on blockchain due to its potential through tokenisation, smart contracts, disintermediation, and distributed autonomous organisations (DAOs) to embed the interests of non-humans into algorithmic systems and create new value systems, leading to radical regulation and redistribution of power.

To meet our aims, we have three objectives:

- 1) To prototype blockchain futures for a more-than-human value system
- 2) To prototype blockchain futures to sustaining the commons
- 3) To develop a method for co-designing blockchain solutions in order to incorporate inclusivity in our algorithmic approach

Why urban agricultural communities?

The concerns of urban agricultural communities are tied up in food justice. Our workshops will take place at Spitalfields City Farm, in the inner east London borough of Tower Hamlets, which is one of the most economically deprived boroughs in the UK. It is characterised by high population density, large-scale immigration, ethnic diversity, poverty and huge divides between rich and poor. It suffers from a range of food-related illnesses, which are further compounded due to the availability of unhealthy eating options. The challenges of volunteer labour, limited access to land, diminishing funding, and diverse users of urban agricultural communities provide opportunities to study the more-than-human entanglements and the food commons (Heitlinger, 2019). Finally, we can draw on our track record of working with such communities on justice issues to guarantee a successful outcome.

Approach

We will use a speculative participatory design (SPD) approach that we have developed, tested, and synthesised (Heitlinger et al, 2019b) to explore futures that are grounded in the values, needs and challenges of real communities. We also draw on the expertise of Furtherfield, a London-based arts organisation, who have developed an award-winning programme of engaging non-technical participants in blockchain futures. The approach is interdisciplinary, drawing on methods from art and design, STS, and computer science, in order to ensure that the project generates futures that have been examined both practically and critically.

Project Design



Initial literature review and synthesis of existing civic blockchain projects will inform the development of a new method for engaging urban agricultural communities in envisaging blockchain sustainable food justice futures (**objective 3**).

We will deliver 4 SPD workshops with Furtherfield. The first two workshops will elicit the specifications of a more-than-human value system (**objective 1**), and identify resources within the food commons (**objective 2**). The latter two workshops will introduce DAOs, multicurrency spaces, data-based constraints and privileges, and blockchain-based voting, in order to explore opportunities, risks and challenges of blockchain solutions. We will explore embedding the interests of non-human actors such as soil, seeds and water in algorithmic systems, allowing these actors to mediate value exchange and intervene in decision making processes (**objective 1**). We will also explore algorithmic functions for sustainably managing the common resources through tokenisation and smart contracts (**objective 2**). Materials produced from workshops will inform the design of conceptual prototypes of blockchain-based systems for food justice, which we will present at a public event.

Recruitment

Participants will be recruited through our network of urban growers, and with the help of project partners. A mix of backgrounds will be sought to ensure a breadth of perspective.

Data collection and analysis

Data includes photographs, audio recordings and their transcripts, sketches, low-fi prototypes from workshops and public event. We will analyse the data with a thematic analysis, coding for themes relating to: sustainability, diversity, commons, justice, inclusion, decentering (of both the human and the infrastructural).

We will produce a set of implications for design which will serve as a basis for a CHI paper and a printed booklet.

Project outcomes will raise awareness about, and open new opportunities for, developing algorithmic solutions for a sustainable food justice system, and serve the basis for a larger funding proposal.

Elsden, C. et al (2019). Making the blockchain civic. *interactions* 26.2 (2019): 60-65.

Heitlinger, S et al (2019). The Right to the Sustainable Smart City. In CHI'2019.

Heitlinger, S et al (2019b). Co-Creating "Smart" Sustainable Food Futures with Urban Food Growers. In C&T'2019

4. NOVELTY OF PROPOSAL

Please explain the novelty of the proposed research project (<150 words).

This project is novel because:

1. It applies the treatment of algorithmic justice to a novel application area i.e. food justice.
2. It extends recent work into the "civic blockchain" (Elsden, 2019), by considering a novel combination of more-than-human and commons-based angles for blockchain to address the problem of food justice.
3. It also takes a novel approach to engaging diverse citizens in blockchain, synthesising best practice and merging both the speculative and the participatory, ensuring that the outcomes are



future facing, whilst remaining grounded in the needs, lived experiences, and values of real communities.

5. NON-ACADEMIC PARTNERS

Please explain how your non-academic partners will engage with the project e.g. in-kind time, use of facilities, etc. (<150 words)

Spitalfields City Farm is a charity in east London that provides opportunities for local residents of the local community, many of whom are outside full-time employment, to learn about and grow food. The farm will help with recruitment of participants, dissemination activities, and advise the project through 3 steering meetings.

Furtherfield is a London-based arts organisation that has pioneered an award-winning programme of engaging citizens with blockchain futures. They will help design and deliver the workshops and prototypes, disseminate the results, and write an essay for the booklet.

Gaia Foundation is a London-based, global NGO that works to revive bio-cultural diversity, regenerate healthy ecosystems and strengthen community self-governance for climate change resilience. They will offer advice from their programme on UK and Ireland Seed Sovereignty, help with recruitment and dissemination of outcomes, and contribute an essay on food justice for the booklet.

6. DELIVERABLES AND SOCIAL IMPACT

Explain the outcomes and deliverables of your project as well as the expected social impact. Please ensure this answer is suitable for a lay audience (<300 words).

The project builds on prior successful partnerships with urban agricultural communities in London, to work with people from low-economic and culturally diverse backgrounds, who may be out of full-time employment. The project will produce new configurations of humans and non-humans (such as soil, water and seeds, as well as technologies and their infrastructures) to distribute control and autonomy more equitably within the food system. We will contribute to social impact through a more sustainable food justice system by co-designing algorithmic prototypes to support more-than-human values and sustaining the food commons. We will develop a novel method of inclusive engagement with blockchain, that we will test with diverse urban growers. In these ways we aim to redress some of the imbalances in the global corporate food system and build capacity within the community for economic resilience in ways that are more nourishing to each other and the earth.

Expected outcomes include:

- 1) Specifications for a more-than-human value system
- 2) New understandings of how to sustain the food commons
- 3) Prototypes for blockchain-based solutions to 1 and 2 including critical examination
- 4) A new method for co-designing blockchain to incorporate inclusivity
- 5) Implications for designing algorithmic solutions to sustainable food justice futures including best practice for engaging diverse citizens

These outcomes will be achieved through the following deliverables:



- 1) **D1:** Literature review and synthesis of existing methods for civic engagement in blockchain
- 2) **D2:** New method for engaging urban growers in blockchain futures for food justice
- 3) **D3:** 4 workshops with urban growers on blockchain futures for food justice
- 4) **D4:** Creation of conceptual prototypes evaluated with users
- 5) **D5:** Creation of a booklet, public engagement event, a Conversation article, website, and 1 conference paper

The pilot project will form the basis for a larger funding proposal.

7. WORK PLAN

Please outline the work-plan for your proposed research/activity (<200 words).

Workplan	Months	1	2	3	4	5	6
WP 1: Literature review of civic blockchain and engagement methods (PI, Col, RCol)							D1
WP 2: Co-design workshops with urban growers (PI, RCol)			D2		D3		
Activity 1: Develop new method from literature review, and together with Furtherfield							
Activity 2: Recruitment of participants							
Activity 3: Delivery of workshops 1-4 on different themes							
Activity 4: Analysis							
WP 3: Design and evaluate prototypes (PI, RCol)						D4	
Activity 1: Design series of prototypes with Furtherfield based on workshops							
Activity 2: Evaluate prototypes at an engagement event at the farm							
Activity 3: Analysis							
WP 4: Dissemination (PI, Col, RCol)							D5
Activity 1: Design and print booklet							
Activity 2: Create and update public facing website							
Activity 3: Journal or conference paper							
Activity 4: Public engagement event to present prototypes							
Activity 5: Conversation piece							
DELIVERABLES							
D1: Literature review and synthesis of blockchain engagement methods							
D2: Develop new method for engaging urban growers in blockchain futures around food security							
D3: Co-design workshops with urban growers on blockchain futures for food security							
D4: Creation of conceptual prototypes evaluated with users							
D5: Creation of a booklet, public engagement event, a Conversation article, website, and 1 conference or journal paper							

8. HOW WILL YOU COMMUNICATE THE FINDINGS OF YOUR RESEARCH TO THE PUBLIC?

Please outline your dissemination plans e.g. events, networking with local support groups, creating vlogs, writing blogs, etc. (<200 words).

Website: A public facing website will highlight the background, context, aims and objectives of the project, advertise information about the workshops. We will post blog posts about each workshop and event.

Workshops and event: The public will be engaged through 4 workshops and a final dissemination event where we will present our co-design prototypes. We will recruit workshop participants who are experienced food growers as well as those interested in civic and sustainable blockchain solutions. The final event will engage the general public, including those interested in algorithmic justice, and food justice in particular, including policy makers such as Tower Hamlets councilors. At this event we will present the design prototypes and seek to engage public opinion in the design futures.



Publications: We will write a report from the findings for the online magazine the Conversation. We will produce a public facing booklet to present the prototypes and project findings for a lay audience, which we will disseminate to sustainable food organisations and centres including Sustain, the Heritage Seed Library, Jellied Eel, Centre for Food Policy at City, University of London, Gaia Foundation and Capital Growth.

Presentations: Longer-term plans include presenting the findings at events such as YFood Tech Wednesdays, and the London Food Tech Week.

9. EXISTING FUNDING

Will any existing funding be used on this project (e.g. PhD funding)? If so, please provide information on these and how they will be used on the project.

10. TRACK RECORD OF APPLICANTS

Please indicate any previous relevant experience, qualifications and publications of the lead applicant and team (<200 words).

Sara Heitlinger was the lead researcher Co-I on the EPSRC-funded Connected Seeds and Sensors project, exploring co-designing Internet of Things with marginalised urban growers for sustainable food justice, resulting in publications at PDC'18, and CHI'19 (honourable mention award) and a Community Collaboration Award for Research. Her publication at C&T'19 synthesises findings from the SPD approach that she has successfully developed and tested.

Alex Taylor's research, spanning the areas of Science and Technology Studies and HCI for over fifteen years, has examined the co-constitutive roles human-nonhuman composites play in forms of knowing and being, and how they might open up possibilities for transformations in society. He has been involved in a number of grassroots projects concerned with the role of technology in building sustainable communities. See Crivellaro et al. (2016) and Taylor et al. (2015).

As a Postdoctoral Researcher on the European Research Council project Citizen Sense, **Lara Houston** worked with citizens in London to prototype air quality monitoring infrastructure. This fed into a Neighbourhood Plan, the development of local campaigns, discussions in Parliament, and a forthcoming related article in the 'Sensing Practices' special issue of Science Technology and Human Values that she also co-edited (forthcoming September 2019).

11. BUDGET BREAKDOWN

Please provide a detailed budget breakdown and justification for your budget - for example: salary grade, point, duration and %FTE; specified journeys or conferences; identified items and quantities of consumables (<300 words)

Staff: We have budgeted for Sara Heitlinger (PI) to work on the project for 20% FTE for 6 months at grade 7, point 43.

We have budgeted for Alex Taylor (Co-I) to work on the project for 5% FTE for 6 months at grade 8, point 51.



We have budgeted for Lara Houston, a postdoctoral Researcher Co-Investigator to work on the project (35% FTE) for 6 months at grade 5B, salary 33.

Consultants: We have budgeted a subcontractor fee of £5665 for Furtherfield to help design and develop the workshop method, to deliver the 4 workshops, and help design the conceptual prototypes. This fee recognises their expertise in developing creative and speculative methods to engage non-technical audiences in envisaging blockchain futures, for social inclusion and environmental sustainability. This fee also includes their writing an essay for the publication. We have allocated £1640 in order to pay for 8 x growing experts £41 each as an incentive to attend each of the 5 x 2-hour events.

Other: We have also budgeted for catering (£515) and venue hire (£1545) for the 5 events. Additional items include paying for audio transcription (£824), and the design and print of a booklet to disseminate the results of the project (£1854). Workshop materials (£494)

11. TOTAL PROJECT COST

Please list in GBP under the headings - Overall cost, Staff, Travel and Other

	Directly incurred costs (80%)	Directly incurred costs (100%)
Staff	13715.31	17,144.15
Non-Staff Costs: Consumables	395.52	494.40
Non-Staff Costs: Facilities/Equipment	9,615.42	12,019.28
Non-Staff Costs: Travel		
Non-Staff Costs: Estates (RA's only)	1,597.16	1,996.45
Non-Staff Costs: Indirect (RA's only)	6,630.32	8,287.90
Overall Cost*	Total Not Equal Funding Requested: 31953.75	Total for information only: 39,942.18

Directly Incurred Posts



Role	Post	Start Date	Period on Project (months)	% of Full Time	Scale	Increment Date	Basic Starting Salary	Super-Annuation and NI (£)	Total cost on grant-80% FEC (£)	Total cost on grant-100% FEC (£)
PI	Lecturer	1 sept 2019	6 months	20	7.43	1.08.2019	£48,677	2011.22	5,199.94	6,499.93
Co-I	Reader	1 sept 2019	6 months	5	8.51	1.08.2019	£63,463	664.58	1,702.10	2,127.63
Research Co-I	Postdoctoral RA	1 Sept 2019	6 months	35	5B.33	1.08.2019	£36,261	1999.83	6813.27	8,516.59

*Please note you are able to claim for RA time and RA relevant FTE related costs, PI/Co-I time and other non-staff costs. You are not able to claim for FTE related costs attributed to PI/Co-I time.

Further Information

If you have any further questions regarding this call for proposals, please contact notequal@ncl.ac.uk or Kate Kelly (Not Equal Project Manager) on 0191 2088268.

