HOMO LUDENS LUDENS 2008

"The Play Algorithm - **A**(n):= n_r [r = *1,2,…..N*]".

B Aga, Katina Hazelden and Mike Phillips.

> *(…) people operate as a type of distributed intelligence, where much of our intellect behaviour results from the interaction of mental processes and the objects and constraints of the world and where much behaviour takes place through a cooperative process with others. (Norman. 1993)*

The Play Algorithm is an element of Social Operating System (S-OS) (www.s-os.org), a collection of creative interventions and strategic manifestations that provides a new and more meaningful 'algorithm' for modelling 'Social Exchange' and proposes a more effective 'measure' for 'Quality of Life'.

A(n):= n_r [r = *1,2,…..N*], where **A**(n) is probably the value of the Quality of Life, and [r = *1,2,…..N*] are the numerous calculations that happen within a city. These calculations constitute an invisible fabric woven through the everyday processes of social exchange (a smile, a swap, a sneer) and can be understood as a Social Operating System when made manifest through the use of digital technologies.

This paper discuses the contribution 'play' makes to '*N'* in the S-OS algorithm. Play provides a vehicle to understand the social learning processes involved in a Social Operating System. Collaborative imaginative play activities provide an ideal context to study the role of others, objects and the environment in the active development of cognitive and social skills. Assuming that aspects of imaginative play are contingent on the environment, a Social Operating System cannot ignore the role of the 'play algorithm' within its calculations. If learning is constructed from enacting on the world, and we accept that cognitive processes are distributed, social and embodied, then S-OS has the potential to cultivate new play practices that emerge when context, cause and effect are malleable.

S-OS.org:
S-OS has been developed to propose and calculate a new 'Social Exchange Index' based on a unique methodology that links the strategic S-OS applications and processes to the Governments 'Quality of Life Indicators'. These indicators are used by government to measure 'success' and progress towards economic, social and environmental sustainability, calculating 'quality' by measuring 'quantity'. They suggest that happiness lies somewhere at the end of a bell curve and that true love can be found in a slice of a pie chart.

S-OS is an ongoing experiment that was manifest in an exhibition in Plymouth Arts Centre from February to April in 2008. The exhibition consisted of an number of creative interventions made by, B Aga, Daniel Bater, Gianni Corino, Lorenzo Verna, Andrea Giacobino, Gabriele Isaia, Motor, Shaun Murray, Mike Phillips, Andrew Prior, Justin Roberts, Chris Saunders, Chris Speed, and research assistants from the Digital Art & Technology Programme at the University of Plymouth. The S-OS project provides an Operating System for the social life of the City of Plymouth. It superimposes the notion of an 'OnLine' Social Operating System onto 'RealLife' human interactions, modelling, analyzing and making visible the social exchange within the City.

Whilst town planners and architects model the 'physical' City and Highways Department's model the 'temporal' ebb and flow of traffic in and around the City, S-OS will model the 'invisible' social exchanges of the City's inhabitants. Plymouth Arts Centre will be converted into a 'Central Processing Unit' to run S-OS as a 'RealLife' Social Operating System, generating creative interventions and strategic manifestations on, by and for the citizens of Plymouth.

The 'Play Algorithm' initiative is framed by the individual projects which constitute the exhibition at Plymouth Arts Centre. These consisted of: **Informal Music** (Prior and Roberts): an audio/visual manifestation which mixes the acoustic environment of the City of Plymouth through recordings of social exchange (conversations, songs, whistles and rants), noises and traces of human communications in and around city. The resulting signals provide an acoustic residue or echo of human interaction. **Routines:** (Routines Collective) maps selected representatives of the 240,000 residents of Plymouth through a series of GPS drawing and photographic documentation. These routes and traces highlight the routines of human behavior across the city. **Cyborgian Geographies:** (Murray, Saunders) traces the interactions of four selected social groups within the City, creating

a series of interacting images that feed of and into the overall value of the S-OS. **Revaluation:** (figure 1) (Aga, Bater) juxtaposes currency exchange systems (based on the British Pound) with embryonic non-monetary exchange and trading systems, such as Freecycle and Happies (see below), to propose a revaluation and a potential devaluation of the British Pound against these emergent systems.

Figure 1: Revaluation

Happindex: (figure 2) uses a mobile phone app to measure the little exchanges that take place daily to allow individuals to calculate their personal ‘Happindex’. Personal Happindex’s are collected, pooled with others and processed to measure Plymouth's overall Happindex.

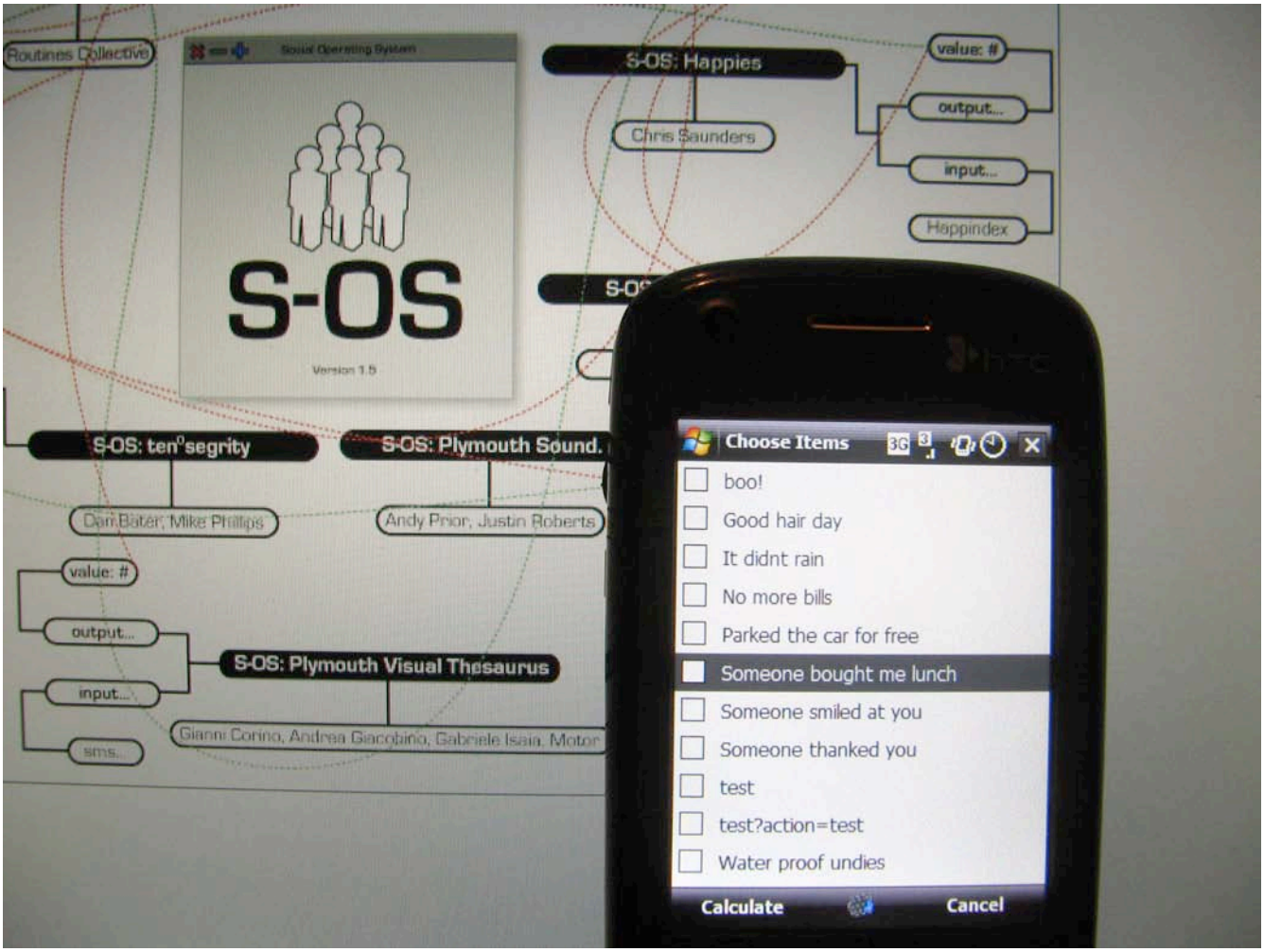

Figure 2: Happindex

Plymouth dn[T]3 or Plymouth Visual Thesaurus: uses sms to allow a collective digital graffiti, a social tagging of a city. Using a folksonomies model to build a semantic ecosystem, a memetic ecology of the city shown it's social capital, through a collection of tags. **Ten°segrity:** allows mobile phone portraits to be Bluetoothed to a database which allows relationships to be constructed. Subsequent interaction with the application reveals the social tensions that bind a community through the dis/con-tinuous push/pull forces of tension and compression, or attraction and repulsion. The integrity of the tensions captured within the ten°segrity application provides a numerical value of social synergy and degrees of separation. ten°segrity outputs the value of the synergetic forces within these volatile social relationships.

Each one of the above projects feeds an output 'value' to the S-OS **Index** (*figure 3*)**.** The index uses the S-OS Algorithm: $\mathbf{A}(n) := n_r\ [r = 1,2,\ldots..N]$ and allows visitors to the exhibition to prioritise one input over another. This last ambiguous human interaction provides the final value of $\mathbf{A}(n)$! The calculation is/will be complete.

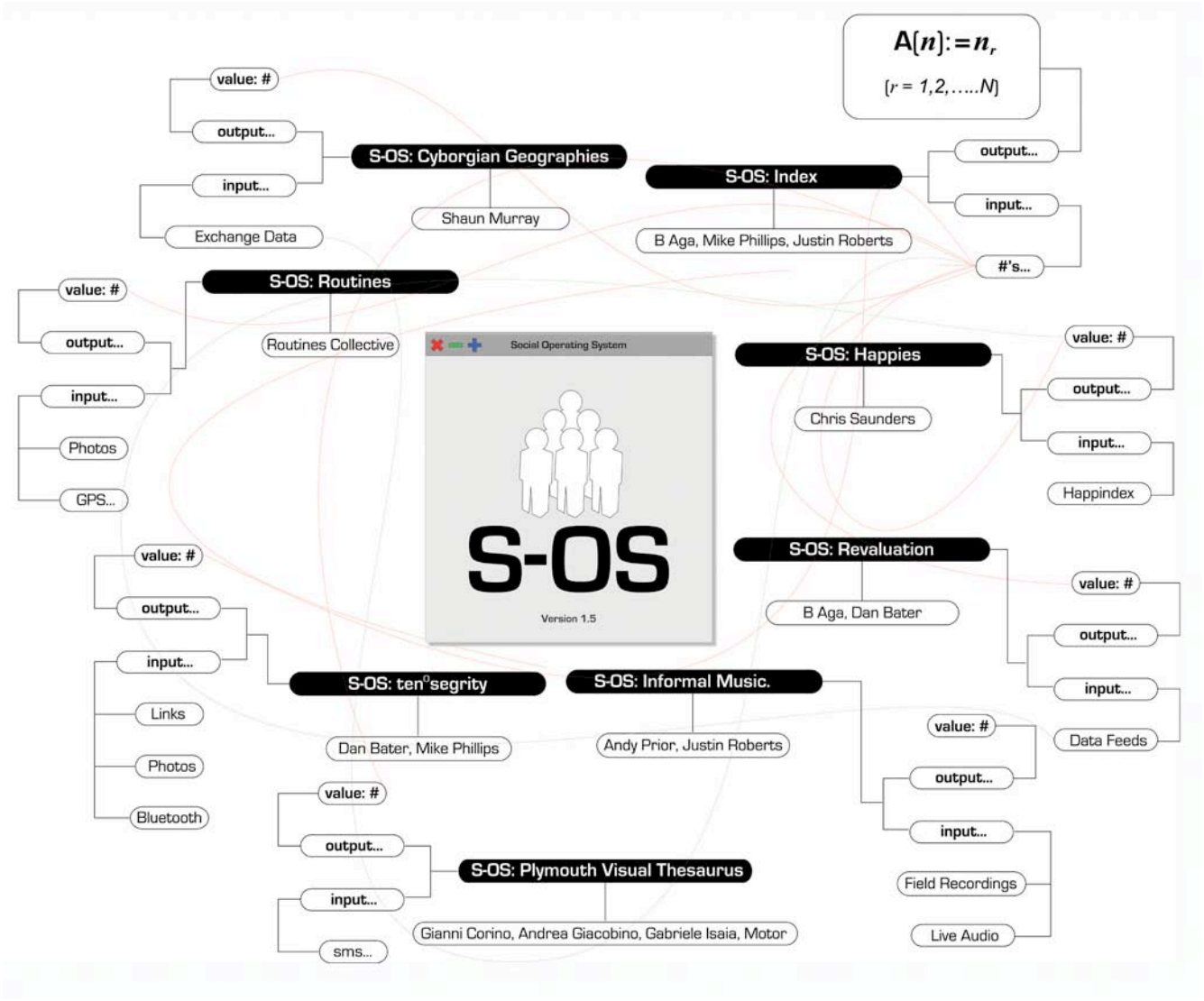

Figure 3: S-OS Index.

"A child could do that":

The 'Play Algorithm' is integrated into the Social Operating System through research into telematic learning environments (Infinite Infants) for reception level children. In order to achieve effective technological and design solutions, primary and secondary research initially sought to understand how learning occurs, with particular focus on how physical and social learning spaces support learning. Learning processes are especially interesting when children are the subjects, as there are some very clear shifts in the cognitive functions as the mind develops. Children at school entry stage, are in a state when cognitive activity moves from a reliance on physical action to mental constructions. Jean Piaget (1959) terms these stages as preoperational to concrete. This translates into children being able to use mental processes much more extensively, rather than the purely sensorimotor stages of children under the age of 2 years. As they enter school, they can imagine things that aren't there – which could be defined as the being of creative imagination – and consequently this is the stage at which they start to engage with imaginative play. According to Piaget children do not achieve fully abstracted thought until they reach early teens, but at about the age of six they can think abstractly, but only about things they have experienced.

Here cognition is recognised as a cultural, socially distributed and embodied activity. These concepts are drawn from the principals of distributed and embodied cognition, and their application in the design and evaluation of socio-technical systems in situated contexts (Hutchins 1994, Rogers 2006). In this view, learning occurs when

engaging with others, tools and spaces; knowledge is constructed from an active engagement with the social and physical environment. The distributed cognitive perspective provides a theoretical and conceptual framework for the designing and evaluating learning spaces and systems which could contribute to a Play Algorithm within a Social Operating System. This route to distil the human / artefact / space relationship requires close analysis of individual and collaborative action and language in context, to uncover the breadth of cognitive activity, from internal thought processes to action and dialogue.

Since the work of the founders of Early Childhood Education in the early part of the 20th century, a debate about the nature and quality of play has continued taken place. Generally play in mainstream education is offered as a reward, rather than a model for teaching. A study by Rubin et al (1983, cited Sutton-Smith 2001) demonstrated longer and regular play can promote better imaginative social constructions and can achieve, even at reception level, group autonomy. Further Vygotsky observed a child in play, always behaves beyond his average age and above his daily behaviour - play is an opportunity to reach beyond limits.

Play resists definitive definitions as the activity represents a wide range of qualities, functions and practices to different social groups, ages and cultures. In the context of this mix of social and individual evolution it is reasonable to consider the play processes as a series of rehearsals or strategies working across a range of environments (class room, playground, school bus, etc) frantically trying to calculate meaning and value.

Catherine Garvey outlines a board inventory of characteristics that described a pleasurable activity, motivated but with no extrinsic goals, spontaneous and voluntary, and involving some active engagement. She acknowledges it is easier to determine what is not play than what is. This is an important characteristic as differentiating between these two states in could help draw out the attributes that enable the play state to be maintained (Garvey 1977).

Sociodramatic play is thought to function as a platform to test both situations not yet experienced in real life, and those lived through - to deal with emotions towards reality (Garvey 1977, Sutton-Smith 2001). Consequently, the shape of the play narrative is driven largely by the affective state of the players, however the emotional states expressed in play is about their feelings towards reality and is not about the direct representation of reality. “It takes the world apart in a way that suits their own emotions to it” (Sutton-Smith 2001).

Collaborative sociodramatic play, which involves adopting characters within a collective scenario, is considered to be an arena for developing competence as a member of society (Garvey 1977, Vygotsky 1978), it both reflects and explores culture and social behaviour. Role playing activities require children to act out other’s thoughts and actions, and portray of emotion appropriate to varied situations (Bergen 2002), suggesting play has a role in the progression from the egocentric nature of pre-school children.

Whilst playing in very early years, children start with an imaginary situation very close to real ones. Action and perception of objects mimics that of real life, an illusionary situation is created, but “there is very little imagination” (Vygotsky 1978). It is more memory in action that a novel imaginary situation. Piaget describes this phase as the enactive stage, as learning is often concrete and explored through physical interaction and manipulation. As play develops, a sense of purpose and identifiable objectives emerge, which are recognized in advance of the activity. At primary school age children are beginning to separate meaning from object - there is an increasing creative interpretation in the use of space and artefact.

> In play, things lose their determining force. *The child see one thing but acts differently in relation to what he sees. Thus a condition is reached in which the child begins to act independently of what he sees.*’ (…) In play, thought is separated from objects and action arises from ideas rather than from things (Vygotsky 1978, p.97).

In this context the Play Algorithm operates as an abstraction of form and function, the action and process transcends literal meaning and the endless repetition of stone paper scissors generates a series of values that can legitimately feed into a Social Operating System. Within a Social Operating System these values could effectively be juxtaposed against other abstract value systems such as the FTSE, Nasdaq and Dow Jones.

Childs Play:

The values generated by the Play Algorithm are often ignored, even by the participants involved in play. The abstract nature of these values often means they are wasted, the precision algebra of hopscotch calculations trickling out across the playground or the numeric chants of nursery rhymes echoing pointlessly through empty classrooms. A Social Operating System can effectively put these additions and subtractions to effective use.

Play evolves as childhood fades, the sophistication of the play algorithm and its calculations is enhanced through the addition of rules and a play 'grammar'. For most, fantasy play in our daily interactions is short lived, and is only really a pastime of the very young. As children develop socially, cognitively and linguistically, they tend to opt for more structured and defined activities.

> 'The "make-believe" sociodramiatic play of early childhood reaches it's height between the ages of 4 and 6 and then declines drastically in middle childhood. Middle childhood ushers in a new era of leisure-time pursuits, namely, games with rules' (Fein, 1981).

Of course, children participate in games from early childhood, but their comprehension and cooperation with the rules of engagement does not emerge until their physical, cognitive, emotional, and social skills are able to cope with the potential complexities. They need to understand enough to relate rules to others and achieve widespread agreement about the basis of the game rules.

Though there are distinctions between younger children's fantasy play and game playing, they are not two completely dissimilar activities. Children's sociodramatic play is contradictory as it is both phantasmagorical and ritualistic, both spontaneous and routine. Despite the obvious originality of what children are doing, their continuous negotiations and their shared knowledge - their repetition of the details indicates that they are highly conservative. 'What is at first glance innovative play is found to be highly ritualized series of events' (Sutton-Smith 2001).

The roots to repetition and rules in games can be linked to interactions with adults in early childhood (i.e. peek-a-boo). 'These observations suggest that games with rules have a natural history that begins with our first experience of the social world.' (Garvey 1977). Children can demand routine (watching the same film, same bedtime story) and sometimes enforce quite random rules around their daily activities (placement of food on their plate, order that shoes are put on). Childhood games are governed by explicit rules that can be taught and learned, often passed down by generations.

> 'Games have the quality of "social objects" – that is, a game has a clear beginning and end and its structure can be specified in terms of moves in a fixed sequence with limited set of procedures for certain contingencies.' (Garvey 1977).

Games which have retained longevity, and enjoy some universal use in the playground include tag and chase, imitative games, and games involving a central figure of low power (e.g. Blindman's Bluff, Hide and Seek). The tendency towards different types of games for children is often bound by culture. The essence of perceived positive behaviour and social practices are distilled and enforced through the structure of engagement.

It is possible that this longevity is also the result of a more refined and effective series of calculations of the play algorithm. Here the calculations processed though the play grammar of these kinds of games provides a more refined and meaningful 'play algorithm' for generating a more effective 'measure' for 'Quality of Life'. Or it could be that these games more closely resemble the highly socialised activities of adult behaviour, ie 'work'. Could it be that for children play is work? (*figure 4*) If this is the case then the myriad of calculations generally considered by adults to be 'meaningless' play have a vital role to play in the calculation of the 'Quality of Life'. In fact it is probable that by failing to factor the play algorithm into our calculations we have been generating a global deficit.

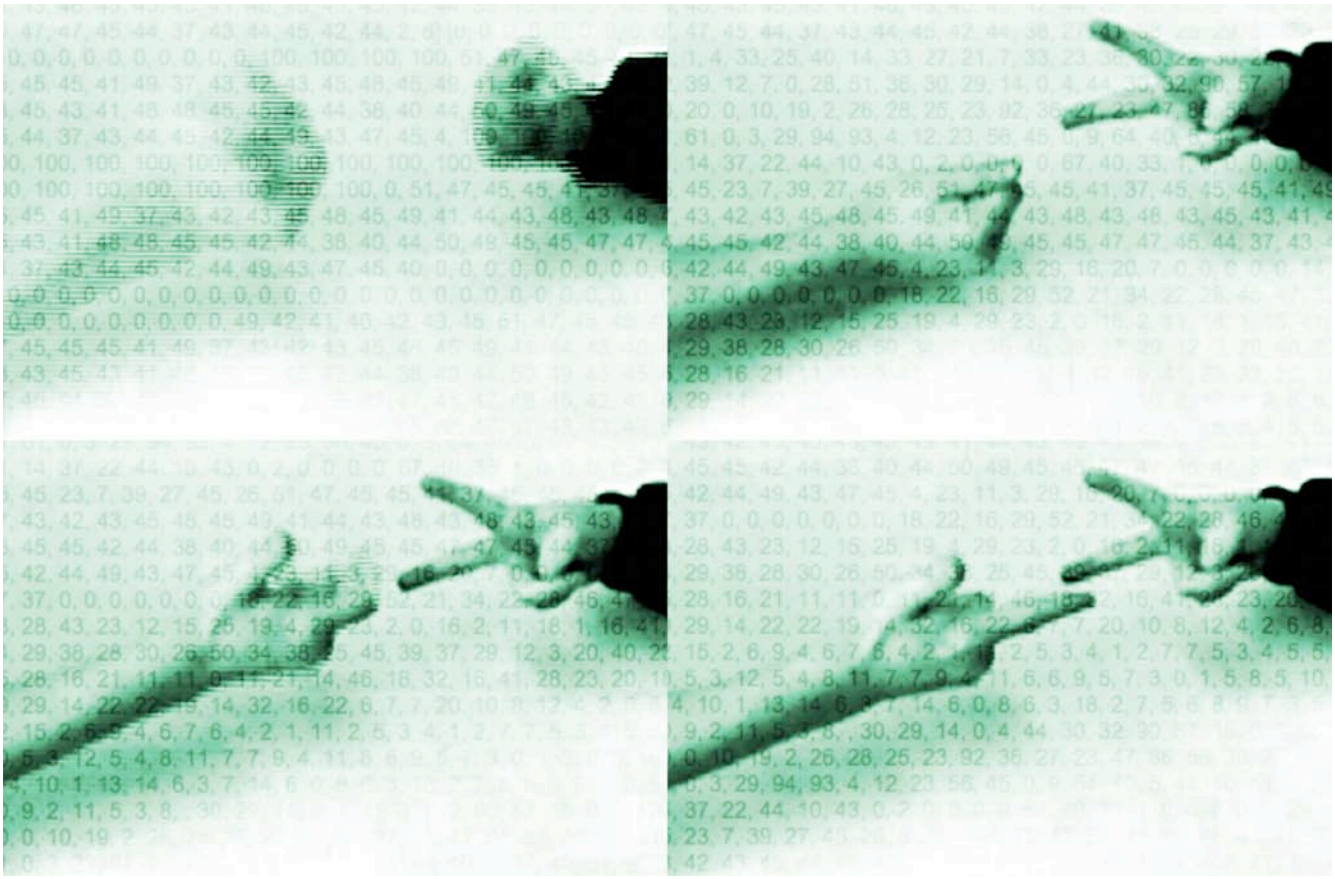

Figure 4: Work.

Notes:

S-OS is the product of a collaboration between Plymouth Arts Centre and i-DAT to present a series of new projects and residencies that have been developed to explores new systems and technologies for artistic production, dissemination and participation that challenge the traditional models of creation and consumption of art. Residencies for Artists Stanza (UK), Eduardo Costa (Brazil) and Curator Basak Senova (Turkey) create a rich context for 'S-OS: Social Operating System for Plymouth' which is framed by the emergence of online social networks and concepts of 'Social Exchange'.

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