Abstract
The paper unpacks my working methodology in the creation of large, multi-year projects based on the segmentation and grouping of ideas, materials, and objects into chunks. As case study I use my current project *Al GRANO: Framing Worlds*, a composite gallery installation with individually installable pieces that can be connected in various combinations. Exhibited together, the chunks compose a large project that addresses conflicting historical, cultural, technological, and political positions related to maize, a contested grain considered both food and cultural symbol in Mexico, and source of macro profits for multinational agribusiness. I discuss the process of recodification embedded in the artwork itself and the influence of a Latin American literary ‘tour de force’ in my practice of dismantling languages and codes. I furthermore examine how the structure of material, changed through bioengineering, can be used to stress that the hybridization between natural and biotechnological genes is a source of division that spawns in countries such as Mexico - the need to establish geopolitical immunological structures for the protection of ecological and cultural infection from external forces. I conclude by articulating that an interdisciplinary approach in the use of art and technology tools and systems can serve to critically inspect temporally and spatially continuous permeation of infamous incidents throughout social and political worlds.

Keywords
Maize, biodiversity, contamination, Mesomaerica, histories, languages, chunking, composition, decomposition, recodification.

Introduction
*Al GRANO* is a hybrid, multi-year project in which I use art tools and methodologies to inspect the debates between Mexico and the USA about maize and its genetic avatars; controversies that involve monumental issues about cultural validation, language, identity, ecological balance and heterogeneity in Mexico, center of domestication and biodiversity of maize. I view the defense of maize from a Latin American perspective influenced by my own cultural journey: I was born in Argentina, and I lived in Mexico and in the U.S.A. Corn Belt. The fundamental arguments involve a reaction to capitalist interests that instigate the protection of Mesoamerican cultural integrity, specifically by indigenous populations who defend native seeds, their lands and their livelihoods. With this in mind my work *Al GRANO: Framing Worlds* evaluates the idealized vision of scientific and technological progress and questions the rush by agribusiness to produce genetically modified corn to supply the needs of an expanding industry of processed foods and bio-products. This brings about a chain of imbalances in environmental and human ecologies affecting maize’s biodiversity, causing impoverished soils and water depletion, and furthermore instigating the demise of small-scale farmers and the loss of ancestral agro-ecological knowledge systems (Fig. 1).

Approach
*Al GRANO: Framing Worlds* deploys a staging of fact and fiction where various registers of images, objects, texts and time-based pieces overlap; a strategy that I also applied in previous multi-year projects such as *Tower Tour* (1994-1997), *Home Transfer* (2000-2002), and *Where are you from? Stories* (2002-2009). As with these precedents the *Al GRANO* enterprise (begun in 2010) develops in chunks with the creation of aggregate projects that are hosted under the *Al GRANO* umbrella. Developing a project via *chunks* is part of my research and creation method, which consists of an inquiry on inhabitation, transculturality, human migration, and sustainable living. ‘Chunking,’ a term coined by one of the founders of cognitive psychology, George A. Miller, is used to describe the splitting and grouping of concepts into small
meaningful units. It is considered an information measure for cognitive systems, from computer science to linguistics, with applications into broad cognitive skills (from pianists’ finger tapping, to chess players’ memory retrieval.) Studies claim that ideas are represented in the cerebral cortex by overlapping sets of neuronal assemblies and their synaptic interconnections. In chunking new ideas, a new neuronal assembly is recruited to represent a thought. The meaning of the new chunk idea is established via ‘chunk-constituent overlap’ and/or ‘chunk-constituent association.’ [5] Chunking, seen as both a triggering device and as a code building device, provides me with a useful theoretical framework to describe my operational model when researching and exhibiting layered, multi-year projects – a system that requires me to identify chunks from a sequence, and to then organize and classify these into categories that relate to the whole (Fig. 02), much in the same spirit of what Nelson Goodman referred to as “composition and decomposition” in the process of “worldmaking;” a practice that consists of: “...taking apart and putting together, often conjointly: on the one hand, of dividing wholes into parts and partitioning kinds into sub-species, analyzing complexes into component features, drawing distinctions; on the other hand, of composing wholes and kinds out of parts and members and subclasses, combining features into complexes, and making connections. Such composition or decomposition is normally affected or assisted or consolidated by the application of labels: names, predicates, gestures, pictures, etc.” [6]

The method of chunking (taking apart, reordering, and putting together) helps me inspect a complex subject by focusing on a particular chunk, with all chunks allied to the project’s nodal concept (such as sustainable living in Al GRANO). In combining chunks into chunks one can gain greater information, and by breaking them down one can examine their constituent parts. Any chunk is always connected to another and can potentially impact or reshape other chunks. The process is analogous to putting together Lego pieces in that interlocking chunks can conjoin in any direction to create a larger form. When I assemble chunks of research as a group in public exhibitions, different subjectivities are produced as viewers/participants experience spatio-temporal orderings of chunks that provide new experiences and sensations of known and fresh information, allowing the brain to create new connections – to ‘rewire’ itself and construct new insight and meaning. In my view, this process favors the emergence of new knowledge.

Languages / Histories / Codes / Glitches

Al GRANO: Framing Worlds is a gallery installation composed of three chunks having as common element the manipulation of languages, histories and codes – the latter pointing to the underlying structure of genetic systems. The individual yet connected chunks are titled: Al GRANO: Hack, Al GRANO: Crop-Cropping and Al GRANO: Injection-Infection.

Al GRANO: Hack is composed of 13 digital images printed on adhesive vinyl – silhouettes cut out in the shape of Maya glyphs adhered directly onto a gallery wall. Al GRANO: Crop-Cropping is an interactive work designed for portable, touch-sensitive devices. These two pieces illustrate how even when I focus on one particular chunk, this one is always part of another chunk, connected in a way that might change the content but not the concept of the chunk. As I discuss further on, the connection between these two is the notion of ‘glitch.’

Additionally, both chunks integrate Mesoamerican Maya glyphs as well as texts from a seminal novel that I discovered over the course of my research: Men of Maize, written by Miguel Angel Asturias, Nobel Prize winner of Latin American Literature. Published in 1949, [7] it intermingles social commentary, myth and legend to address the sustained struggles by indigenous populations who defend their right to grow maize as daily sustenance and not as commodity to be commercialized for profit – a profanity in the eyes of Mayan people whose sacred belief
system sustains that men are made of maize. Although the novel *Men of Maize* was inspired by corporate exploitation of maize and the demise of Mayan peasants in Guatemala in the 1930s, the country is never named with the intent to represent Latin America as a whole, embracing the continent’s whole history of conquest. *Men of Maize* is deeply influenced by early Mesoamerican Maya Quiché [8] narrative culture, and though it was misunderstood when it was first published due to its style and structure, it is now considered to be one of the “vertebral literary texts of twentieth-century Latin America.” [9] It was the first great experiment in what critics now call “magical realism” and today it is also considered “a green conservationist document.” [10]

After reading Asturias’ novel in Spanish and in Gerald Martin’s English translation, I became fascinated by its relevance in the present. What Asturias described as a phenomenon of exploitation occurring in the first half of the twentieth century, can be easily transposed and applied to what is happening in Mexico today in the twenty first century, namely, the exploitation of indigenous peoples, of the land, and of maize, by national and international corporations. The menace was – and still is – not only the potential erasure of domesticated maize seeds and of ecosystems, but also of indigenous Mesoamerican cultures and their ancestral knowledge systems.

Miguel Angel Asturias’ biography was in itself revealing to me. I learnt that he had studied ethnography in Paris where he became involved in translating the famous Mayan bible the *Popol Vuh* or Book of Counsel, considered to be the Maya book of origin. Asturias was deeply influenced by the *Popol Vuh* when writing *Men of Maize*. Not only was he impressed by the narrative structure of the mythical text, most importantly, the very act of translation helped him discover the weight that words carry for indigenous peoples for whom naming is a sacred act with magical characteristics that furthermore empower what is named. [11]

Taking into account that I was a language translator myself in my youth, this biographical note revealed during my research on Asturias was of great interest to me. I was equally drawn by the complexities involved in the translation of culture through language. This accounts for my fascination with the three-step process involved in the translation of the *Popol Vuh*. The process entailed a conversion from the phonetic Mayan hieroglyphic system, to the Western alphabetic system, and then to the Spanish language; a translation detour that actually began in the 16th Century during the Spanish conquest with bishop Diego de Landa who imposed the Western alphabetic system onto the Maya writing system (Fig. 03) by teaching and forcing Maya scribes to write their language in Latin letters. [12]

The denaturing imposition of one writing system onto another has resulted in many transcription errors [13] – or what I’d like to call ‘glitches.’ Seen in this light, the processes of recodification begun by De Landa and sustained through time, adds up to compounded dislocations that Asturias takes on in his novel, and that I address in *AL GRANO*. They are disjunctions about empirical attitudes towards reality, notions of space and temporality, and the displacement of languages and writing systems – what Gerald Martin describes as the division of the eye and ear via the juxtaposition of the syllabic over the phonetic writing method. [14]

I found this account intriguing due to my works’ focus on the social sphere and the means by which people have a voice in society. Additionally, my long-standing interest in language form, language in context, and the associated processes of social and cultural translation that convey and assign meaning, compelled me to delve deeper into Mayan hieroglyphs – an investigation that guided my decision to adopt certain glyphs as icons for two chunks; *AL GRANO: Hack* and *AL GRANO: Crop-Cropping*. I created new juxtapositions of languages and codes to generate purposeful glitches where hidden transcripts reside, hence representing the incessant efforts by elite groups to penetrate, disrupt and erase sites of knowledge and the corresponding efforts by subordinate groups to defend them. [15] To such a degree, these glitches embody a creative activity of resistance and the option to cultivate, and to even mobilize new modes of thinking and of doing.

I began work by researching and consulting existing Maya dictionaries – looking into basic glyph signs that have been deciphered – and I created a discrete inventory of glyphs that represent nouns, adjectives and verbs, or verbal phrases, all of them related to the area under discussion, for example: maize god, earth, tortilla; to scatter, to harvest, to demolish; in addition to representations of time, such as: it happened (past), it happens (present), it will happen (future). [16]

Once done with the lexical inventory, I probed into my archive of digital images of corn that I have photographed in the past four years, and opened them - not in an image editor - but rather in a ‘hex’ editor that revealed the images’ coded hexadecimal and ASCII languages. [17] Then, with the intention of putting into practice my own recodification process, I proceeded to crop and erase sections of digital code, introducing citations from the novel *Men of Maize*; excerpts that speak of the devastating effects produced by capitalism and international companies on the lives of indigenous maize growers, having a profound effect on their customs, ancestral beliefs and cultural identity.

Figure 03. Detail of Diego de Landa’s “alphabetic” interpretation of Maya hieroglyphs in *Relacion de las cosas de Yucatan*, 1566.
My relentless process of code erasure and substitution – via the injection of content in a different language – created ineludible disruptions in the digital corn images resulting in digital glitches. These glitches play an idiosyncratic role in the chunks: Al GRANO: Hack and Al GRANO: Crop-Cropping and they draw attention to the notion of ‘denaturing’ [18] that animates the whole Al GRANO thesis. In a match of front and back, the glitches embody the tensions between surface appeal and the exposed background clamor. Al GRANO: Hack shows the front end of code that drives the artwork and Al GRANO: Crop-Cropping the back end.

The chunk titled Al GRANO: Hack (Fig. 04) is composed of 13 curvilinear silhouettes in the shape of Maya glyphs that bear individual language representations: maize god, earth, tortilla; to scatter, to harvest, to demolish, etc. They appear under the guise of deceptively bright graphic symbols that upon closer inspection reveal their ‘denatured’ character as corrupted digital images. Indeed, these silhouettes showcase the ‘front end’ of photos of corn whose ‘back end’ codes have been hacked, modified by a steady nervous tension infusion of disquieting texts from the novel Men of Maize. The resulting glitch images have an attractive and lush surface appearance dominated by striated bright colors such as pink, red, turquoise, and blue; colors quite unlike those of the objects photographed. In truth, the prints are as eye-catching in their surface appeal as packaging designs of processed foodstuffs sweetened with fructose corn syrup derived from genetically modified corn, and as deceptive as the shallow promise of a better world anticipated by bioproducts such as corn ethanol and corn plastics (PLA). (Fig. 5)
The chunk titled **Al GRANO: Crop-Cropping** (Fig. 06) is a free App designed for mobile devices and it has a pictographic interface bearing the same 13 Maya glyphs used in the piece I just discussed – but devoid of all color in this instance. The work can be seen as the previous chunk’s shadow due to its austere black and white presentation showcasing the ‘back end’ hacked code that drives the ‘front end’ of the lip smacking GM corn glitch images. In addition, the piece’s interactive design invites the user to engage with the past, the present and the future of maize by using their fingers in small gestures. By tapping, swiping, pinching and zooming, they engage in a game of deciphering meaning through ASCII and hexadecimal languages mixed with texts in the western syllabic language. These texts, extracted from the novel *Men of Maize*, highlight the plight of indigenous Mayan people in defense of maize culture (Fig. 07).

Yet another chunk titled **Al GRANO: Injection-Infection** (Fig. 08) is comprised of three sculptures. With the intention of exposing how the structure of material is changed through bioengineering, I used a 3D printer and PLA bioplastic to produce the sculptures. These three dimensional renderings show the structural formula of fructose, amylase, and polylactic acid; laboratory-processed components sourced mostly from transgenic corn, and used in the production of foodstuffs, biofuels and bioplastics. The work points to the effects of large-scale agro-industrial production of transgenic corn in order to optimize crop yield intended for the production of bioproducts. High fructose corn syrup (HFCS), corn plastics (PLA), and corn based ethanol – sourced from GM corn – cause a genetic and physiological imbalance in native maize varieties, disrupt local ecosystems, damage agricultural fields and also take away from local populations – specifically indigenous populations in Mexico – land that could be used for subsistence food crops. Indeed, the spread of USA-led agribusiness supported by the colossal NAFTA trade accords [19] required neither seed segregation nor labeling and in 2001 Mexican researchers discovered contamination of native maize landraces by GM corn genes that threatened maize’s viability and the ancestral diversity developed there through traditional breeding. Truly, maize agriculture – whether native, hybrid or transgenic – does not only touch upon cultural and identity issues, it also touches on economic and civil realms. The contamination of

![Figure 06. Al GRANO: Crop-Cropping (2013). Composite image with screenshots captured on an iPhone from the interactive App. ©Pat Badani, 2015.](image1)

![Figure 07. Recodification process. Detail captured from the hex editor in one of several digital prints on transparent acetate included in Al GRANO’s solo exhibition. Centro de Museos, Universidad de Caldas, Festival de la Imagen 2014, Manizales, Colombia. ©Pat Badani, 2015.](image2)
landraces created the need to establish geopolitical immunological structures for the protection of cultural, ecological, and commercial infection from external forces [20] such as government-required moratoriums and requests that the USA undertake mandatory seed segregation so that it could guarantee Mexico the importation of only nonGM-corn. Further – to this day – citizen-led groups of resistance continue to lobby in defense of maize. Noted examples formed by indigenous, mestizo and rural communities are Red de Defensa del Maíz [21], and Pro-Oax [22] an organization in Oaxaca spearheaded by artist Francisco Toledo.

Conclusion

*Al GRANO: Framing Worlds* embodies internal disciplinary means that relate to its external relational context. Shaped by conflict situations instigated by a small grain with monumental impact and informed by interdisciplinary research in geopolitics, literature, science and technology related to maize and to GM corn, the *Al GRANO* enterprise exemplifies how creative practice in electronic arts can shape material complexes in a critique that is essential, incisive and also disruptive in its analysis of knowledge systems, processes and ideologies. The project’s artistic means – tools, artefacts and systems – brings into play transnational communities and their practices over time, sites of memory and displacement, languages, codes and glitches.

With the intention of constructing a comprehensive image about a very complex topic, I use a “radical reordering” [23] research and creation method involving chunking and restructuring of temporally and spatially heterogeneous material and information. Gallery visitors encounter spatio-temporal orderings of installation pieces that articulate contrasting positions (Fig. 09). They engage in a process of “elaborative encoding,” [24] associating and connecting new and known information, and encoding...
unfamiliar features or attributes to the representation of events. This process of reframing knowledge favors the emergence of fresh perspectives needed to challenge the idealized vision of scientific and technological progress, fomenting the possibility of cultivating alternative modes of being and making.

Aware of differing narratives that tenaciously emerge out of government officials; out of policy makers; out of research scientists and biotechnology experts; out of media and journalism; out of lobbying groups; out of farmers, artists, writers and the general public, my aim with this highly faceted multiyear project is to reveal a new pattern of value and enquiry in a troubling phenomenon that has persisted for decades. I speak to the gaps and glitches that exist in processes of codification, and recodification of national and continental narratives related to maize as food, and equally as cultural symbol. [25]

Endnotes

1. The term ‘genetic avatars’ refers to new genetic organisms created by scientists working for biotechnology corporations who are able to rewrite and alter the genetic codes of different species, and by so doing, create a new incarnation or manifestation. The term is used by Maryse Carretero in the title of her book *Histoires de maiś: d’une divinité amérindienne a ses avatars transgéniques* (Paris, Editions du CTHS, 2005).


8. Quiché people are a Mayan ethnic group noted for mixing Catholic with ancestral Mayan practices, forming a contradictory religious system.


10. Ibid, page xviii.


12. Franciscan bishop of Yucatan, Fray Diego de Landa was a Spaniard famous for his writings on Yucatan culture, namely for his book *Relacion de las cosas de Yucatan* in which he included an erroneous "summary" of Maya hieroglyphics. Assuming that the Mayas wrote with an alphabet, he asked his native informants to write "a" "b" "c" and so forth, in Maya. The Mayas, on the other hand, heard the syllables "ah" "beh" "seh" and naturally attributed glyphs using these phonetic values, accessed May 17, 2015, http://www.ancientscripts.com/maya.html

13. See the story behind the centuries-long decipherment of ancient Maya hieroglyphs in *Cracking the Maya Code*, PBS, NOVA, aired April 8, 2008.


17. OXEd, an open source, native hex editor based on the Cocoa framework.

19. The North American Free Trade Agreement (NAFTA) signed by Canada, the United States and Mexico came into force in 1994 and was intended to eliminate barriers to trade and investments between the three countries.


Author Biography

Born in Argentina and having lived in Uruguay, Peru, Mexico, Canada and France, Pat Badani currently lives and works out of Chicago, U.S.A. She is an arts practitioner, critical thinker, educator, editor, and curator. Badani’s praxis is concept and context driven and involves artistic research and creation around such topics as inhabitation, transculturality, human migration, and sustainable living. Her works have been shown extensively in international venues – museums, festivals, art centers and galleries. Essays examining her practice have been published in several languages in solo and group exhibition catalogues, in art magazines, academic journals, and in thematic anthologies. Her own scholarly essays have been published in English and Spanish in symposium proceedings, journals, and in book chapters. As art educator in several institutions in Canada, France and the U.S.A., she has been instrumental in curriculum creation related to interdisciplinary practices. Since 2011, she is Editor in Chief of Media-N, Journal of the New Media Caucus, an international scholarly online and print journal.