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GenDyTrouble Cyber*Feminist Computer Music

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*GenDyTrouble: Cyber*Feminist Computer Music* is the current instantiation of a larger ongoing project entitled *GenDyTrouble*. This part of the project takes the form of a multi-channel computer-music performance. The underlying concept of the project is a symbolic collision between Greek-French composer Iannis Xenakis' technique of sound generation, 'Génération Dynamique Stochastique' (often shortened to GenDyn or sometimes GenDy) and Judith Butler's foundational work of queer theory, *Gender Trouble: Feminism and the Subversion of Identity* (1990). As a thought experiment, it asks what fusing the mathematical-generative power of computers with an emancipatory gender-politics could achieve. The project perches critically on the shoulders of previous cyberfeminists to both create and listen to what a sonic cyberfeminism could sound like. It is a provocation, rather than an answer.

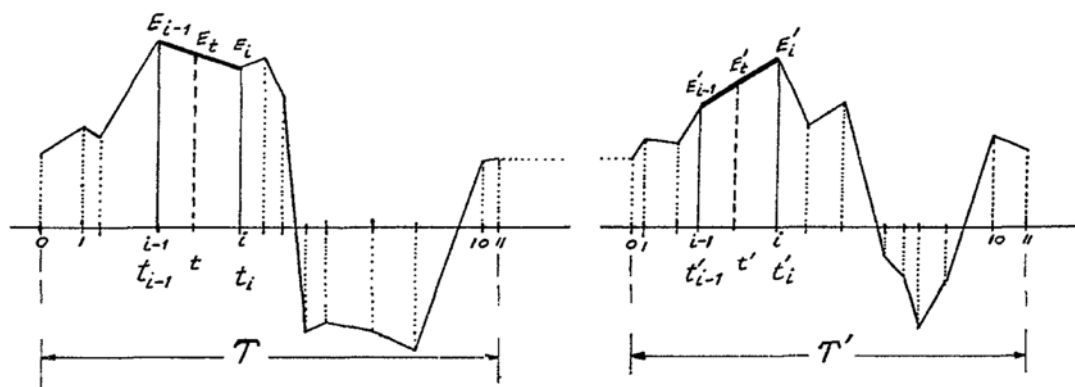
SuperColliding¹ Xenakis and Butler

The brief supercollision of this unlikely duo focuses on extracting a compatibility within their

ideas stemming from the common "**gen-**" prefix of the words "**génération**" and "**gender**" respectively. Both Xenakis and Butler were and are eminent figures in their respective fields, but *GenDyTrouble* rejects the tendency to signify Xenakis as the father and Butler as the mother of this project – a lazy heteronormative metaphor. Their disparate worlds are bridged via the stem "**gen-**", with its etymological roots in Latin and Greek of genus, genesis, generare, genos, gonos. These evoke multiple concepts – of a kind or class or things, of birth, of begetting, of producing, of descent – all central to the matter at hand.

The work of Iannis Xenakis (1922-2001) exemplifies an emphasis on innovation in post-war avant-garde modernist music in Europe. Frustrated with the impasse of his contemporaries within the scenes of electroacoustic music and elektronische Musik. Xenakis' book *Musique Formelles* (1963, translated into English as *Formalized Music* in 1971) outlines his musical visions and his formal techniques in great detail, particularly his uses of mathematical models and stochastic processes in sound.

He had a marked distaste for natural sounds, staunchly



‘Abscissa of the polygon’s summits’ from Xenakis *Formalised Music* (1992) p. 290. Courtesy of publisher, Pendragon Press

rejecting the Fourier Transform² as the dominant paradigm for sound creation.³ Freeing himself from aesthetic ideals of the “*beautiful*” or “*ugly*”, his focus on formalism and the specificity of computation made his approach distinct from those attempting to imitate nature by electronic means. He proposed instead the use of digital computer technology to create a sound that was “*rich and strange*”.⁴ His extreme dissatisfaction with the state of avant-garde music at the time positions his usage of “*gen-*” as “*génération*” within a modernist desire to produce new sounds and traverse untrodden territories.

Judith Butler’s *Gender Trouble* transformed understandings of gender and sexuality both inside and outside of the academy. As a philosopher, Butler was not as concerned with “*creating newness*” in the same way as Xenakis was as a composer, nor are their approaches easily comparable. Yet *Gender Trouble*’s wide-reaching impact and success was due to the intellectual innovations it brought to feminist discourse. A central tenet is to problematize the heterosexual woman as a universal subject of feminism, ingrained in much previous feminist theory. Butler demonstrates how gender as a category is constantly produced and maintained by systems of patriarchy, and called for its subversion. Philosophers, particularly female ones, are rarely endowed with the description of “*genius*” (NB: another word beginning with “*gen-*”). Yet let us take up Butler’s claim of “*sex itself is a gendered category*”⁵ as the crux of her philosophical innovation. Butler asserts that there is no pre-discursive “*natural*” sex upon which the “*culture*” of gender is formed. There is no real “*being*” of sex or gender, yet the idea of woman has become naturalised. By pointing to the internal inconsistencies of the dualisms of sex-gender,

nature-culture, she shows that they ultimately re-inscribe the hegemonic power they aim to resist. Therefore, the philosophical task is to reformulate the question of gender in a way that acknowledges how power structures (of gender, race, sexuality, class, ability, etc.) have acted in order to allow the duality of sex to appear inevitable.

Xenakis and Butler are not without their detractors and critics, yet both have become notable for aspects of profound radicality in their work detailed here. *GenDyTrouble* bridges the gap between the two fields of generative art/music and gender studies and zooms in on one integral concept for each protagonist.

Xenakis: GenDy/GenDyn

‘*Génération Dynamique Stochastique*’ is described in *Formalized Music* as a technique for generating sound using dynamic stochastic processes to determine the points of a waveform. Xenakis’ ‘New Proposals in Microsonic Structure’ details how each iteration of the waveform is made up of linearly interpolated points which form polygonal shapes.⁶ The resulting sound is an artificial, noisy, ‘*brute, raw, unprocessed*’ sound, which exists only within the digital – it cannot be produced by natural sound excitation. Xenakis refers to ‘*GenDyn*’ as the abbreviated form of the process ‘*Génération Dynamique Stochastique*’, but the piece which explicitly makes reference to its usage of this program was entitled ‘*Gendy3*’ (realised in 1991). *GenDyTrouble*’s choice of ‘*GenDy*’ over ‘*GenDyn*’ is partially a reference to Xenakis’ resulting work, rather than the algorithm GenDyn. Moreover, it is a reference to *GenDyTrouble*’s realisation in the program SuperCollider, where the technique has been implemented by Nicholas Collins in

three variants named Gendy1, Gendy2 and Gendy3.⁷

GenDyn's processes are realised on the microsonic level, sound particles of the measure of milliseconds at the threshold of auditory perception.⁸ This principle is emblematic of Xenakis' **'music out of nothing'** approach.⁹ He referred to compositions made using GenDyn principles, as being **'created out of the void'** and **'comparable to the big bang'**.¹⁰

'Génération Dynamique Stochastique' is translated into English as 'Dynamic Stochastic Synthesis'. "**Synthesis**", however, doesn't quite describe the radicality of Xenakis' vision. The technique's significance and use of 'génération' is bound to its newness in two ways; not only as novel to listeners as an erratic and un-natural sound, but furthermore as its very structure constantly reasserts its newness – each iteration of the waveform continues to vary as it is repeated. The generative process means the waveform is constantly deformed and essentially unstable.

Butler: Gender Performativity

Gender Trouble introduced the notion of **'performativity'** to advance an understanding of gender as constituted by the **'stylized repetition of acts'**. This emphasis was aimed at demonstrating how the gendered subject repeats and reiterates norms ascribed to it in mundane and prosaic ways. These naturalise the idea of gender identity as an unmovable substance.

When the constructed status of gender is theorized as radically independent of sex, gender itself becomes a **'free-floating artifice'**.¹¹ Butler's remarks indicate her aim to trouble the gender binary, **'there is no reason to assume that genders ought also to remain as two'**.¹² For Butler, performativity is not just a constraint, it is also a site of resistance, a resource to forge subversion.¹³ As well as being embedded in everyday actions, it can also be understood as a technique with the power to de-stabilize entrenched gender norms. The **"gen–"** of **"gender"** in Butler can be emphasized for its role as a productive process, which through its repetition of acts, is inherently able to re-generate each time gender is performed.

NEW-GEN*-NOW

Paul Preciado expands Teresa de Lauretis' notion of **'technologies of gender'** at work within visual

and textual signs,¹⁴ to include biotechnology within a contemporary **'pharmacopornographic'** regime of drugs, sex, pornography and synthetic hormones. For Preciado **'in ontopolitical terms, there are only technogenders'**. Similar to the cyberfeminists of the 1990s, Preciado rejects the nature-culture binary and proposes the re-appropriation of technologies which produce subjectivity as a form of political agency and empowerment¹⁵ literally taking them to task in his own biotechnological hacking. In the realm of pure artificiality, gender performativity unleashes the multiple possibilities for gender transformation, **'Let a hundred sexes bloom!'** exclaimed the 'Xenofeminist Manifesto' recently, echoing the Maoist slogan about flowers as the fruit of communism.¹⁶

What Preciado establishes on a microbiological level, *GenDyTrouble* attempts on the microphysical and the microsonic level. The stem of **"gen–"** in both GenDy and **"gender performativity"** signifies the potential of sustained ontological rupture, a generative power which varies per repetition, per performance. This is the disturbing and constant multiplicity from which *GenDyTrouble* thrives.

Microsonic TechnoGenders

Amidst a general contemporary crisis in gendered productive and reproductive labour,¹⁷ Xenakis' obsession with creating **'music out of nothing'** and insistence on newness can be criticised as endorsing a problematic tendency in the history of creativity and patriarchy which Terre Thaemlitz terms **'the uterus envy of male creators to give birth'**.¹⁸ However, let us not miss the explicit desire in the word **"generate"** (of genesis: birth, origin, creation) which Xenakis' work cries out for, as an opportunity. The radical affinity with artificiality and generativity, with its de-stabilizing potential and permanent flux, allows us to ask if Xenakis' work, for all of its formalism, does not simultaneously call for a queering of that formalism with the force of generative power.

GenDyTrouble crosses GenDy with gender performativity to sound off the potentiality of multiple gender configurations. The constant instability of the stochastic processes of GenDy is its aim. Its strangeness and artificiality are its assets. Gender performativity's gesture of dislodging the repetitive acts, which are used to enforce staid categories, usually take place on a human

level. Yet pushing down to the microsonic level, below human perception, this foray sees *GenDyTrouble* fighting a perhaps invisible, but not inaudible fight.

Current episodes of *GenDyTrouble*: Cyber*Feminist Computer Music

1. GEN(D)ERATE A NEW

‘Queer is itself a lively mutating organism, a desiring radical openness, an edgy protean differentiating multiplicity, an agential dis/continuity, an enfolded reiteratively materializing promiscuously inventive spatiotemporality. What if queerness were understood to reside not in the breach of nature/culture, per se, but in the very nature of spacetime mattering?’¹⁹ What Karen Barad’s philosophy undertakes on the atomic level, this piece attempts on a (micro)sonic level. Understanding GenDy as a method of a queered formalism, GEN(D)ERATE A NEW makes GenDy (as implemented in SuperCollider) its primary sound source. Fusing instances of generativity (via patterns containing random numbers) with improvisation, this episode aims to sonically enact the instability it prizes.

2. MICROFEMININE SONIC WARFARE

The figure of the female automaton has appeared and reappeared in histories of technology. From the disturbing misogyny of the nineteenth century science fiction tale ‘The Future Eve’ by Auguste Villiers de l’Isle-Adam, through to contemporary life-like robot realisations of fembots or gynoids, this trope can be seen echoed in often more subtle ways in sound, such as in the history of sound synthesis. The fact that the subject of a singing voice to be synthesized which John Chowning demonstrates in his highly valuable work,²⁰ is that of a female soprano, is not considered coincidental in this context. Re-appropriating this trope, MICROFEMININE SONIC WARFARE plays with the appearance and dissolution of sounds with a vocal-semblance into and out of synthetic realms.

3. THE BATTLE OF CYBERSEXES

Using chance functions to dramatize Twitter battles between Mens’ Right’s Activists and Feminist Activists, this piece performs a virtual battle between these two acrimonious cohorts. Computer voices speak genuine Twitter messages from well-known protagonists –

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words are at times spliced unrecognisably down to their granular parts, and at times left to speak their semantic content with clarity. Spatialized in the auditorium as two competing teams, words flit around the audience in male, female and ambiguously gendered voices. Each team is weighted evenly, leaving it to the random choices of the algorithm to decide in favour of one side over the other.

4. MEDITATION ON REPRODUCTIVE LABOUR

Drawing on Terre Thaemlitz’s criticism of biopolitical ideologies in Japan, including a statement in 2007 by Japan’s health minister Hakuo Yanagisawa which described women as ‘birthing machines’, this piece samples Thaemlitz’s track ‘Secrecy Wave Manifesto’. The sample of a woman’s scream at childbirth forms the entire basis of this piece, abstracted through a technique of partial analysis and re-synthesis. In this meditation on reproductive labour, the scream is no longer directly audible, but its visceral power remains as a spectral presence.

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Notes

1. SuperCollider is a programming language and environment for real-time sound synthesis, originally released in 1996 by James McCartney.
2. The Fourier series, used in the analysis of periodic functions into a sum of simple sine waves, became extremely important in the field of computational sound, as a way to analyse and create natural sounding sounds.
3. Iannis Xenakis *Formalized Music: Thought and Mathematics in Composition* Revised Edition. (New York: Pendragon Press/Stuyvesant, 1992). [1963] p. vi and Peter Hoffmann ‘Music Out of Nothing? A Rigorous Approach to Algorithmic Composition by Iannis Xenakis’ (Dissertation. Technische Universität zu Berlin, 2009) https://opus4.kobv.de/opus4-tuberlin/files/2348/hoffmann_peter.pdf [Last Accessed 10.03.15] p. 40
4. Hoffmann ‘Music Out of Nothing?’ (2009) p. 128
5. Judith Butler *Gender Trouble. Feminism and the Subversion of Identity* (NY: Routledge, 1999) [1990] p. 11.
6. Iannis Xenakis *Formalized Music* (1992) p. 290
7. Xenakis refers to GenDyn as the short form of ‘Génération Dynamique Stochastique’, yet the three implementations of the technique in SuperCollider by Nicholas Collins are named Gendy1, Gendy2 and Gendy3 [See SuperCollider help files]. See Iannis Xenakis

Formalized Music (1992)

8. See Curtis Road's definition of microsound in *Microsound* (Cambridge, MA: MIT Press, 2004) p. 4

9. With reference to the title of Peter Hoffmann's doctoral thesis 'Music Out of Nothing? A Rigorous Approach to Algorithmic Composition by Iannis Xenakis'

10. Ibid p. 289

11. Butler *Gender Trouble* 1999 p.10

12. Ibid p.10

13. Judith Butler 'Critically Queer' *GLQ* Vol.1 No.1 (1993) pp. 17-32. Quote, p. 22

14. Teresa de Lauretis *Technologies of Gender: Essays on Theory, Film, and Fiction* (Basingstoke: Macmillan Press, 1987)

15. Paul Preciado (formerly Beatriz Preciado) *Testo Junkie: Sex, Drugs and Biopolitics in the pharmacopornographic Era* Trans. from French by Bruce Benderson (New York: The Feminist Press, 2014). [2008] p. 129

16. Laboria Cuboniks *Xenofeminism: A Politics for Alienation* (2015) (item 6). <http://www.laboriacuboniks.net/#trap> [Last Accessed 12.06.15]

17. See: <http://endnotes.org.uk/en/endnotes-the-logic-of-gender> [Last Accessed 10.03.15]

18. Terre Thaemlitz 'Interview with Todd L. Burns' (London: Red Bull Music Academy. Interview Transcript, 2010) <http://www.redbullmusicacademy.com/lectures/terre-thaemlitz-deep-thoughts> [Last Accessed 10.11.14]

19. Karen Barad 'Nature's Queer Performativity' in *Kvinder, Køn og forskning/ Women, Gender and Research*, Copenhagen, No. 1-2, (2012) p. 29

20. John Chowning 'Perceptual Fusion and Auditory Perspective' in Perry Cook (ed) *Music, Cognition, and Computerized Sound: An Introduction to Psychoacoustics* (Cambridge, MA: The MIT Press, 1999). pp. 267-276

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