A Posthuman Mode of Feeling

The Computational Recomposition of Embodied Voice

Edoardo Biscossi, 2020

Auto-Tune

Auto-Tune is an audio processing software developed by Antares Audio Technologies.

It allows to identify and tonally alter the pitch of an audio input.

A Brief History of Auto-Tune

1997: introduced by Andy Hildebrand, a research engineer specialised in stochastic estimation theory and digital signal processing

1998: the first *recognisable* use of Auto-Tune

2000s: Auto-Tune defines the vocal tone of pop music, especially the pristine, flawless vocal sound of female pop stars

A Brief History of Auto-Tune

2009/2010 Backlash

Death Cab for Cutie declare war on Auto-Tune abuse

The American indie-rockers are proving their credentials by fighting the 'authentic' fight against T-Pain, Kanye, and a thousand digitally altered voices

▲ Death Cab for Cutie ... Death to Auto-Tune! Long live people who can actually sing!

When Death Cab for Cutie hit the red carpet at this weekend's Grammy awards, they were flying the flag for a new and controversial cause. Baby-blue ribbons were pinned boldly to the band-members' lapels - notices of support not for cancer research, debt relief or the homeless, but for the war on Auto-Tune.

TIME

The 50 Worst Inventions

From the zany to the dangerous to the just plain dumb, here is TIME's list (in no particular order) of some of the world's bright ideas that just didn't work out

WORST INVENTIONS

Auto-Tune

15 of 50

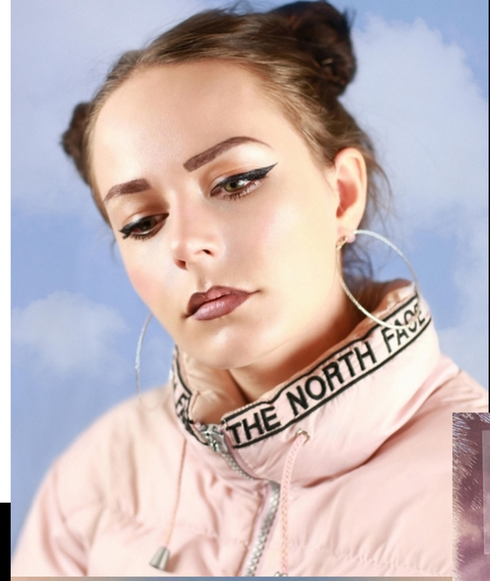
VIEW ALL

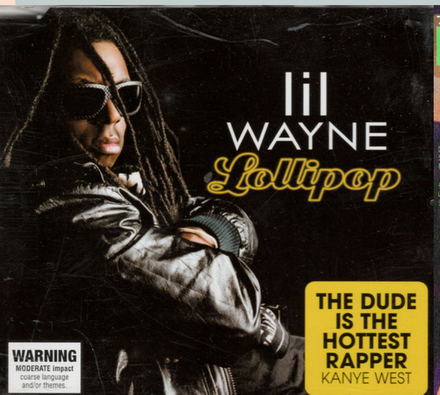
By Dan Fletcher | Thursday, May 27, 2010

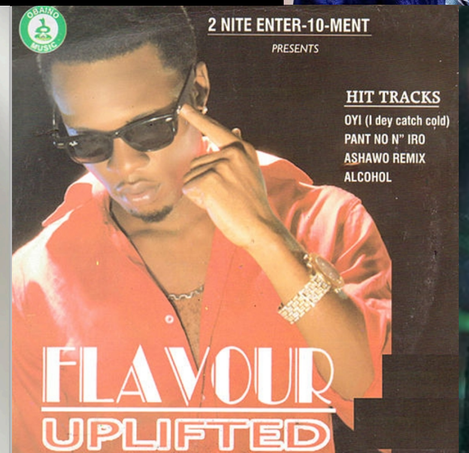
It's a technology that can make bad singers sound good and really bad singers (like T-Pain, pictured here) sound like robots. And it gives singers who sound like Kanye West or Cher the misplaced confidence that they too can croon. Thanks a lot, computers.

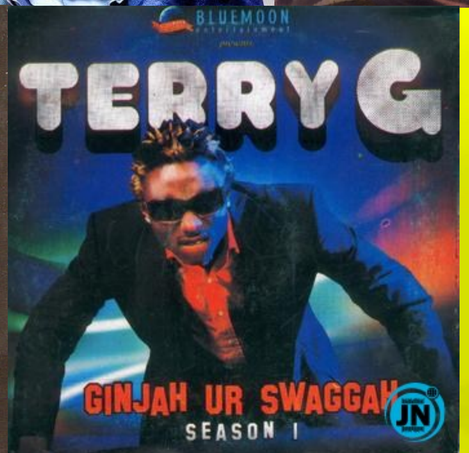
A Brief History of Auto-Tune

The mutant lives of Auto-Tune



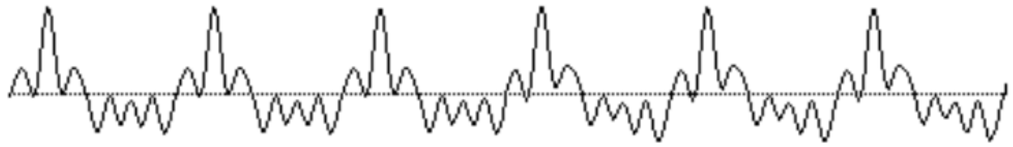






How Auto-Tune works

The vocalists and the solo instruments that Auto-Tune 7 is designed to process have a very clearly defined quality of pitch. The sound generating mechanism of these sources is a vibrating element (vocal chords, a string, an air column, etc.). The sound that is thus generated can be graphically represented as a waveform (a graph of the sound's pressure over time) that is periodic. This means that each cycle of waveform repeats itself fairly exactly, as in the periodic waveform shown in the diagram below:



Because of its periodic nature, this sound's pitch can be easily identified and processed by Auto-Tune 7.

Pitch defines our perception of the *highness* or *lowness* of a particular sound. It represents the speed-rate at which a certain sound vibrates.

The pitch of a periodic waveform is the number of times a periodic element repeats in one second, measured in *Hertz*.

Auto-Tune detects pitch by applying autocorrelation, a mathematical tool for identifying repeating patters - such as the periodic vibration of the voice.

How Auto-Tune works

Auto-Tune automatically calculates the pitch of an input sound.

The pitch is then instantaneously corrected according to the *key/scale* and to the *retune speed* set by the user.

A Genealogy of Auto-Tune

The use of Auto-Tune can be seen *“within a tradition of technologically mediated and synthesised voices within popular music stretching back to the widespread use of the vocoder from the 1970s.”*

Robert Strachan, *Digital Aesthetics: Cyber Genres, Auto-Tune and Digital Perfectionism*, 2017

The Vocoder: from WW2 to Moog

1938: The vocoder is invented by Homer Dudley at Bell Labs as a means of synthesising human speech

1943: Dudley's vocoder is used for encrypted voice communications during World War II, to protect radio transmission against interception. With this method of encryption, none of the original signal is sent, only the filtered, encoded version. The receiving unit needs to be set up with the same filter configuration to re-synthesise a version of the original signal

1948: German scientist Werner Meyer-Eppler published a thesis on the application of voice synthesis to sound synthesis in electronic music

1961: The first song featuring computer-based speech synthesis was a rendition of “Daisy Bell”, using an IBM 704 computer at Bell Labs (also present in *2001: A Space Odyssey)*

1970: Wendy Carlos and Robert Moog built a musical vocoder, with the carrier signal coming from a Moog modular synthesizer, and the modulator from a microphone input

A Genealogy of Auto-Tune

vocal processing in pop music

The use of vocoder by artists like Kraftwerk can be seen as a form of “ironic displacement”, a self-conscious aesthetic dehumanisation, a critical reflection on the cybernetic turn in human subjectivity caused by the increasing mediation of everyday life.

Ian Biddle, *Vox Electronica: Nostalgia, Irony and Cyborgian Vocalities in Kraftwerk’s Radioaktivität and Autobahn*, 2004

A Posthuman Mode of Feeling

Although Auto-Tune might instinctively be understood in line with this articulation of dehumanisation, its *unconventional* use reflects instead the “multifaceted and naturalised character of contemporary posthuman subjectivities.”

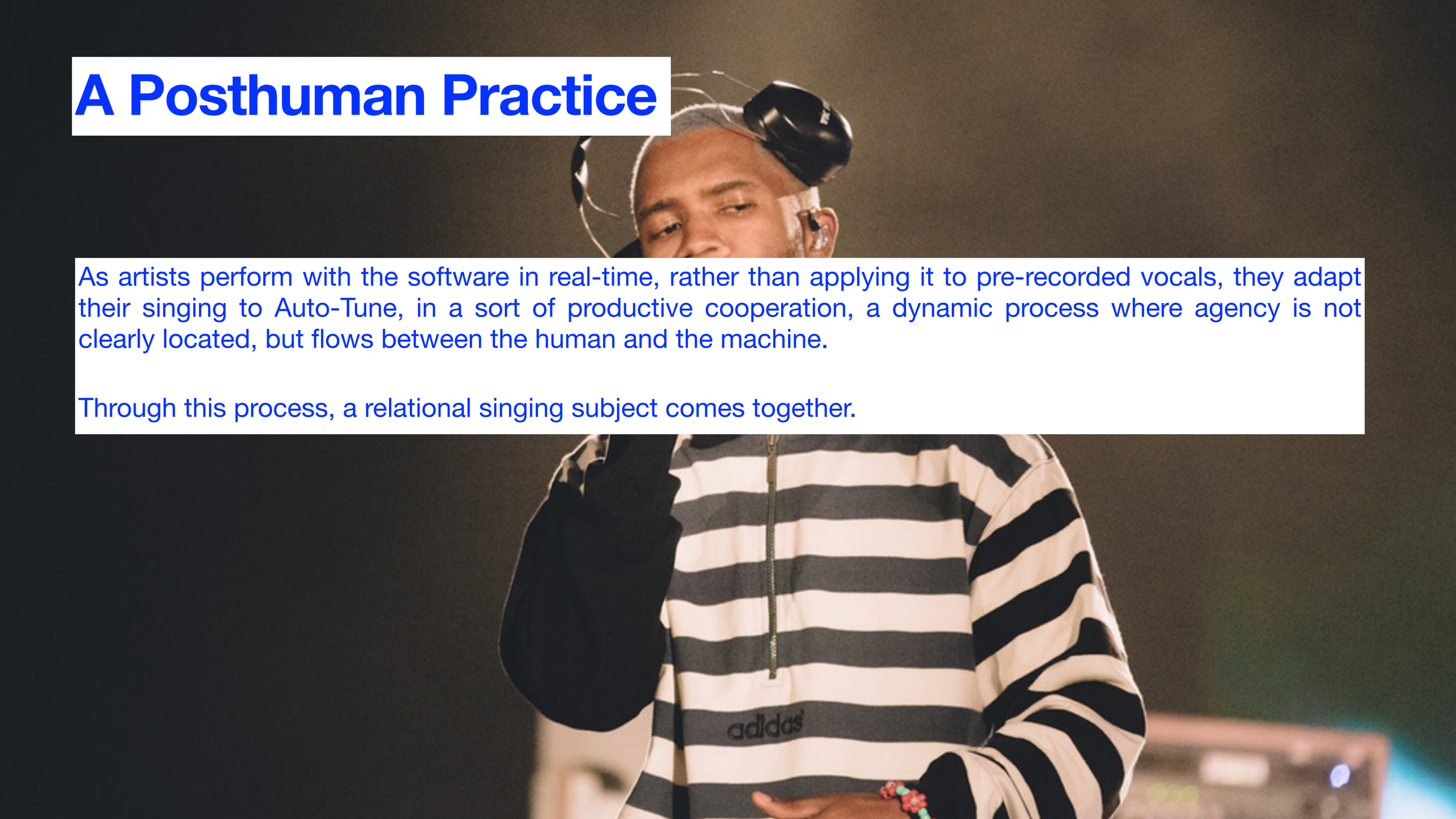
Rather than displacing human emotion through aesthetic dehumanisation, this practice manages to “accentuate rather than mask the expressive and emotional signifiers of the voice”, which “suggests that for producers and audiences there is little contradiction between the technological staging of the voice and its use to convey a variety of differing human emotions.”

Robert Strachan, *Digital Aesthetics: Cyber Genres, Auto-Tune and Digital Perfectionism*, 2017

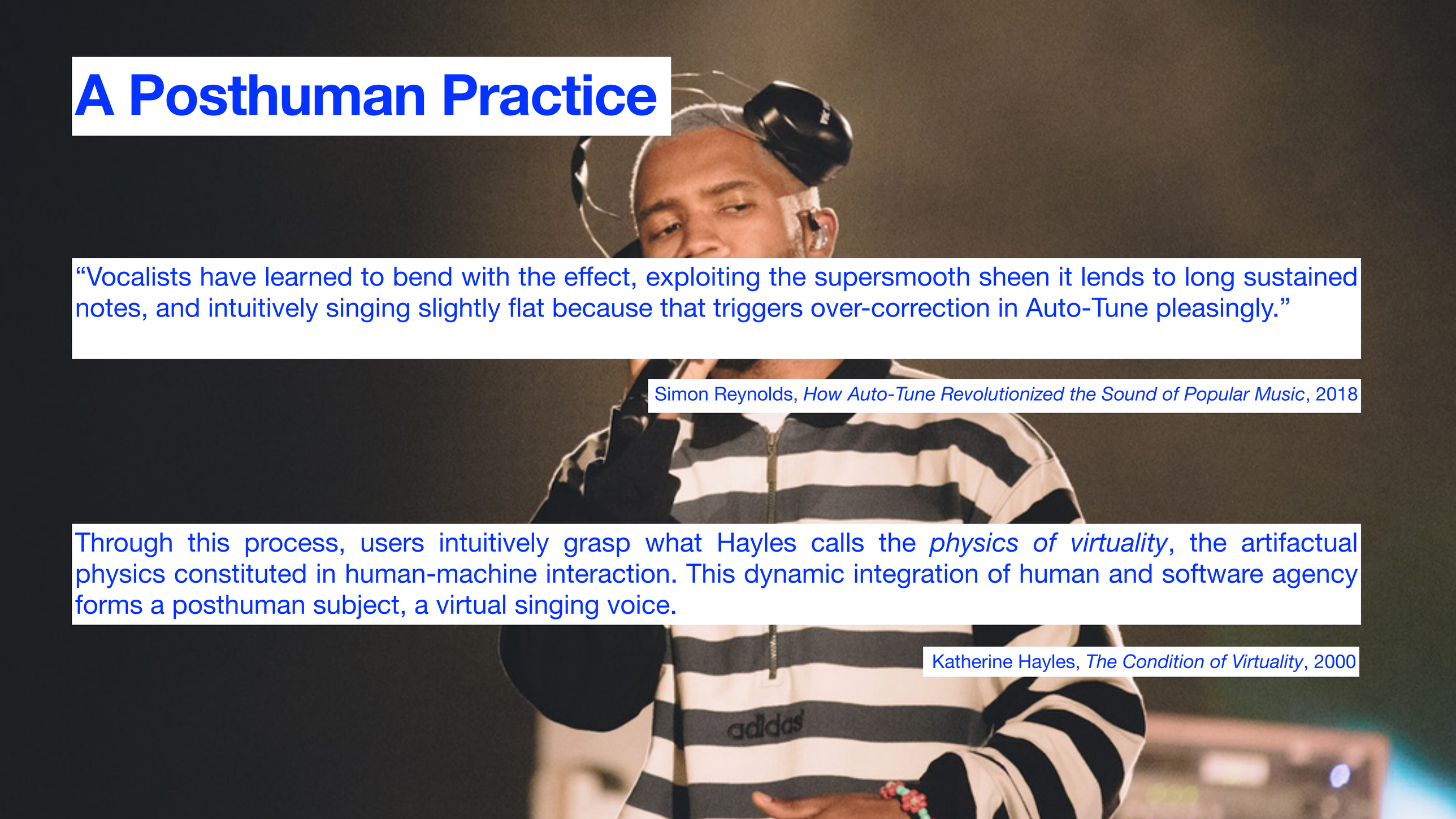
A Posthuman Practice

As artists perform with the software in real-time, rather than applying it to pre-recorded vocals, they adapt their singing to Auto-Tune, in a sort of productive cooperation, a dynamic process where agency is not clearly located, but flows between the human and the machine.

Through this process, a relational singing subject comes together.



A Posthuman Practice



"Vocalists have learned to bend with the effect, exploiting the supersmooth sheen it lends to long sustained notes, and intuitively singing slightly flat because that triggers over-correction in Auto-Tune pleasingly."

Simon Reynolds, *How Auto-Tune Revolutionized the Sound of Popular Music*, 2018

Through this process, users intuitively grasp what Hayles calls the *physics of virtuality*, the artifactual physics constituted in human-machine interaction. This dynamic integration of human and software agency forms a posthuman subject, a virtual singing voice.

Katherine Hayles, *The Condition of Virtuality*, 2000

A counter-protocol practice

The current cultural significance of Auto-Tune exceeds its original technical purpose.

Originally popularised as a labor-saving tool for dissimulated correction and standardisation - to realise an industry fantasy of digital flawlessness - the software is now better known, and loved, as a technique for deliberate distortion and modulation.

This cultural significance is acknowledged in the user manual for Auto-Tune 7.

In addition to its adoption as the worldwide standard in professional pitch correction, Auto-Tune has also gained renown as the tool of choice for what has become one of the signature vocal sounds of our time.

First heard on Cher's 1998 mega-hit "Believe," variations of the effect have gone on to appear on songs from a huge variety of artists. Since there seems to be a lot of mythology about how it's accomplished, we thought we'd provide the official Antares version here.

What is it?

Quite simply, the Auto-Tune Vocal Effect is what is technically known as "pitch quantization." That is, instead of allowing all of the small variations in pitch and the gradual transitions between notes that are a normal part of singing (and speaking, for that matter), the Auto-Tune Vocal Effect limits each note to its exact target pitch, stripping out any variation, as well as forcing instantaneous transitions between notes.

How to do it.

There are basically two key elements to producing the Auto-Tune Vocal Effect:

1. Retune Speed = 0
2. Pick the right scale

That's pretty much it. Really.

Auto-Tune as media technology

Auto-Tune's interaction with vocal sound can be understood as a process of *making discrete:* the message is abstracted from its analog, continuous form and encoded it into discrete numbers, to render it available to software. The software then produces a computational recomposition of that sound.

But digital machines don't feel sonic matter in its continuity, as they can only perceive it in its cut, compressed, discrete form. So, the recomposition will be a mathematical combination of discrete numbers, a synthetic recomposition of what used to be analog vibration, a cubist-like segmented rendering of that originally continuous sound.

Wacky, unsettling, weird!

Through the wackiness and weirdness of Auto-Tune, we can catch a glimpse of computational agency negotiating with human agency.

This sense of weirdness is the coming into contact with an alien other. The mediation of this alien agency de-naturalises the human voice, without displacing, but actually expanding, its expressive capacities.

The result is a more-than-human performance, constituted in this process of discretisation and recomposition, which produces a posthuman aesthetic, mode of feeling, and sense of subjectivity.

A strategy for normalisation

By normalising this software-mediation of the human voice, the use of Auto-Tune in popular music can be seen as “a contemporary strategy for intimacy with the digital.”

Jace Clayton, *Pitch Perfect*, 2009

This normalisation infiltrates popular culture with a posthuman sensibility, and can help us question, on an aesthetic dimension, the dualist human-machine dichotomy that critical posthumanism has already problematised in theory.