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Balinese gamelan is well know as an artistic phenomenon located on the island of Bali, which is an integral part of the musical traditions of the Indonesian archipelago and the gong culture of Southeast Asia.



At first sight everybody immagines its use is related to the rituals of Balinese Hinduism (Agama Hindu Bali), but here, I am going to deepen the discourse on some recent developments in Balinese gamelan music in the 21st Century, focusing my attention on the encounter between gamelan and computer music and considering the aspects of continuity and change related to music traditions.



Cultural tourism (pariwisata kebudayaan) inaugurated by the Dutch colonizers, who carried out a highly successful marketing operation, has undoubtedly linked Bali with the image of the island of the Gods launched with tourism promotion (Bonn 1977; Vickers 1989; Picard 1992).



The historical and cultural transformations that have taken place over the span of just over a century have transformed the island of Bali from a feudal kingdom to a province of a state inserted in international political and economic dynamics.



And although the Indonesian government has continued to develop the same policies with the advent of mass tourism, resulting in tourism being one of the island's main economic and occupational activities (Hobart et al. 1996: 201-226), nowadays, the prototype of visitors seems to be increasingly directed towards figures such as global nomads, surfers, yoga practitioners and the ever-present honeymoon couples in search of tropical beaches.





Starting from these premises, it will not be unexpected that the social and economic changes taking place have been accompanied by two cultural processes: the first of preserving traditions, which allows gamelan music linked to classical and traditional models to see an increasing number of young people involved; and a second of innovation of cultural forms, which has enabled the emergence of artistic micro-communities linked to international music (pop. rock, jazz, reggae, noise, etc.) or to the musical development of Balinese gamelans in new directions. It is clear that it is a typical case in which the anthropology of music theories can be applied in relation to changes to society and music (Merriam 1961; Blacking 1973) but also for reflectin on how "symbolic systems [...] are historically constructed, socially maintained and individually applied" (Geertz 1973: 363-364).





Scholars who turned their attention to Indonesian contemporary music at the beginning of the 21st century have reported on the appearance of a few pioneers who were using music software as a notation tool during the creative process, or live electronics with gamelan, such as the iconic performance of Gerausch (2005) by Sang Nyoman Arsawijaya (Gluck 2009; McGraw 2013; Tenzer 2011; Sugiartha 2012; Bandem 2013; Steele 2013).



Bagian ketiga merupakan bagian akhir dari karya ini. Pola penodom kembali dengan membuat jalinan ritme dengan penopiolan-pola teknik de penyajian warna suara dengan memanfaatkan alat pukal yang berbetasbe Pola ini penuh dengan hentakan-bentakan dan or ilubur dalam tempo sedang tetapi sangar dinare jelinan rime-time tot, komposer

est plat wing berbentuk -

Mean Gerinda yang Ditorchkan pada Besi Pelat Beltentak Geng Mengeluarkan Bola Api dalam Musik Eksperimental "Germech" (Dok: Koleksi ISI Denpasar, 2005)

ur-unsur dekonstruktif dalam karya ini bisa diamati dari empa u ide, instrumentasi, ekspresi musikal, dan tata penyajian, lde an karya "Gerausch" telah mengubah kemapanan tradisi musik monyenangkan penikinat menjadi menganakemaskan ekspresi ik komposer. Tujuannya tidak untuk mencimakan chaos, tetapi kunsikan pemahaman bani bahwa ketidakindahan, kejelekan al bogion yang sah dari sebitah karya seni. Suara sumbang atau ek pada pendirian estetis, oleh para komponis nusik abad ini dipakat sebagai masur uptuk mencapai keindahan. Misalnya ide black in beautijul sebagai musur uptuk mencapai keindahan. Misalnya ide black is beautijul seng muncui di Aturcika Serikat alalah sebuah usaha untuk mengubah keyakinan estetik matusia bahwa yang gelap adalah canok. Dalam hal ini tetelika musur oduk hanya menyingkut soal rasa, telapi juga mencakup masalah kesadaran dan intohigensia manusia dalam aboyikapi. Dalam sebagai uns

On the use of technologies in Bali. Andrew McGraw published a portion of his fieldnotes from July 2008:

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"By 2006 the computer had become an essential tool in Arsawijaya's compositional process. Since the beginning of the reformasi, a small group of musik kontemporer composers, including Arsawijaya, Hendrawan, Yudane, and Suardana, traded pirated music software programs. They were bewitched by the ability to compose and record multitrack works by oneself, independent of the complex social and economic logistics of extensive live rehearsal. Only Arsawijaya regularly used these programs to compose works for large gamelan ensembles. His favored program, Fruity Loops, allowed him to arrange music using an intuitive box-unit interface, avoiding Western notation altogether. The program made possible the almost instantaneous construction of complex forms that would require hours of rehearsal if working with live musicians" (McGraw 2013: 138).

Nowadays, Sang Nyoman Arsawijaya (1980-) has become less prolific than before. Moreover, among the others, only I Wayan Gde Yudane (1964-), who is becoming a key figure in the development of Balinese gamelan in the art music direction composing both for gamelan and western music ensembles, is still involved in integrating computers into the gamelan domain.

Indeed, after completing his studies in gamelan music at the local performing Arts School (STSI), music studies in Java, and in western music in New Zealand (this last one under the mentorship of composer Jack Body) in 2004, Yudane got the opportunity to receive training in electronic music during an artist residency at the Institut international de musique électroacoustique de Bourges (IMEB) in France.







Yudane is the only Balinese composer trained in electronic music. However, he has only sporadically published works created with musical software (Laughing Water 1997, Lakaleke 1998, Terra-incognita 1999, Bali Bioskop 2000, Journey 2004). His use of computers is mainly confined to the compositional process, when he composes gamelan music directly using Western notation, often merging it with ding-dong notation symbols using the Sibelius software.

(I Wayan Gede Yudane, Interview 2019)





My research in Bali was carried out in two periods of fieldwork between 2013 and 2020, during which I had the opportunity to verify that these phenomena have continued to develop with an emerging generation of gamelan composers under thirty years old.















These young artists are all educated in traditional music at the island's Academy of Arts (ISI Denpasar). They have a more integrated relationship with new technologies in comparison to the previous generation. Their creative practices and challenges regarding Balinese music conventions, ideas, and identity manifest ever more often through the combined use of computers and gamelan on stage or social media publications promoting digital gamelan works, a practice that has increased during the pandemic period.

Yan Priya Kumara Janardhana (known as Janu) stand out among this generation of emerging composers of new music for gamelan. He was born in 1992 in penebel in the area of Tabanan, and completed his studies at the conservatory with a degree in Karawitan (gamelan music) at the faculty of performing Arts of Institut Seni Indonesia (ISI) in Denpasar. He is also currently completing a Masters of Art at the ISI of Yogyakarta.

Besides composing instrumental music for gamelan and being a talented musician. Janu has made several works using Ableton Live software to accompany theatrical, dance, and poetry performances. And in the last year, he has been increasing his relationship with technologies by embarking on a music recording business (CTRL Records).

Although Janu is not a musician of the sekaa gong of his banjar and his musical experiences are characterized mostly by a musical background looking towards modernity and artistic innovation. As is typical in Bali, he plays both in religious ceremonies and in secular contexts.

His compositions for mixed media gamelan and computer music are: Monk (2019), Malalama (2020), Monk II (2021).





Komponis Kini is a music program curated by three established and internationally recognized gamelan composers, including I Wayan Gede Yudane, Wayan Sudirana, and Dewa Alit, and hosted at the Bentara Budaya Bali, an Indonesian Kompas Gramedia cultural institution which supports the festival economically. Bentara Budaya is an art museum and performative space in the Ketewel (Gianyar) area voted to modern and contemporary arts, directed by the poet Warih Wisatsana.





(I Wayan Gede Yudane, Interview 2019)





Invited to participate in the festival for the second time. Janu performed his new composition Monk on the indoor stage of the Bentara Budaya using an acoustic gamelan instument. a gender rambat from the gamelan semara pegulingan played by Ida Bagus Hery Yoga Permadi (Gus Hery), and a computer controlled by himself.

The audience was amazed at how the typical vibrato effects found in Balinese gamelan orchestras were achieved with only one instrument of the orchestra. And without knowing the laws of acoustic physics involved, not everyone was able to understand how this happened.

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On stage, Janu was controlling the computer parameters in real-time using a haptic external controller that permitted him to manipulate multiple parameters at once and leave some room for improvisation.



The patch realized using Max/Msp software was programmed to generate soundwaves with precise frequencies to put into dialogue with the fixed tones played by the gender rambat, with the scope of creating a series of beat frequencies from the encounter of the digital and acoustic sounds.





Following the curators' suggestion of paying tribute to the great maestro I Wayan Beratha. Janu takes inspiration from his piece for gamelan gong kebyar called Purwa Pascima. Curiously Beratha had already composed it using sound materials from a classical piece by the ancient gamelan gambang called Panji Marga.

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In Monk, Janu uses the melody used as a tutti section of the kawitan in Beratha's Purwa Pascima, subsequently re-elaborating it in a tripartite structure:

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• In part 1a, he presents the pokok pattern re-elaborated.

The pokok pattern of the traditional gambang piece Panji Marga:

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The melody of I Wayan Beratha's Purwa Pascima :

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- In part 1b, the pokok is repeated and subsequently played in retrograde mode.
- In part 2, the pokok appears as the inversion of the retrograde that appeared in part 1b.

The pokok noted in this way on a millimeter paper by the composer became the music part played by Gus Hery with the gender rambat instrument.

*(the pokok can be roughly explained as the core melody from which the ornamentation and heterophonic structure of gamelan music pieces are usually developed or arranged)

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In the notation of Monk, we can see the value in Hertz as used by Janu:

- the blue numbers represent the frequency of gamelan tone;
- meanwhile, the black numbers are the electronic soundwaves frequency values;
- The green numbers in the Partz indicate the differences in the value of the frequencies (F = Fd Fg)
- Fd = Digital soundwave frequency;
- Fg = Gender rambat frequency.

In part 2, we can see how Janu uses the idea of augmentation and diminution to build up the frequency texture of the piece.

Some discrepancies between the notation made by the composer and the performance are evident. This is a recurrent issue in the performances studied during my research on new music for gamelan and is probably related to the musical training of Balinese musicians in an oral tradition system. In the case of Junu's Monk, the composer himself explicitally uses the notation as a trace from which to create moments of improvisation both for the use of tone and frequency and for the time development of the piece.

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Directing attention to the subtle nature of sounds of the Tabanan area soundscape, Janu found an illumitation that relates his compositional idea to the concept of ombak (literally, waves) present in Balinese gamelan music.



In gamelan ensembles, metallophones are traditionally paired tuned, with the pengisep instrument (male) tuned at a slightly higher pitch and the pengumbang instrument slightly lower (female). Intentionally tuning the instruments in this manner results in acoustic beats characteristic of Balinese gamelan music (Rembang 1987).

Many Balinese says that the ombak and his pulsating vibrato effect bring the gamelan to life, as the fire does in the shadow puppet shows (wayang kulit).





The destructive interference of paired tuning in Balinese gamelan presents a more detailed description of ombak possibilities with the pulsating speed of the created vibrato. Responding to physical acoustic law, shorter differences in frequency will create a faster vibrato. However, after a difference of 5 Hz between the two sounds, we do not perceive an ombak, but a different tone. Balinese tuning tradition and acoustic laws inspired Janu to explore the possibilities offered by music software in his composition.

In this way, he aimed to overcome the possibilities of Balinese paired gamelan tuning.

A second meaning associated with the term ombak refers to fluctuations, like a breath, present in the Balinese gamelan repertoire used in temporal and dynamic flows. This meaning is also applied in Monk. The two musicians fluctuate the meter concerning the feeling perceived by the pulsating vibrato (ombak). During the performance, faster vibrato is interpreted by musicians with a shorter duration of the tone played; meanwhile, a slower vibrato sound is allowed to resonate longer.

The encounter between gamelan and computer music represents just one of the innovations that are reshaping new music for gamelan in Bali. Nevertheless, as in the case of Priya Kumara Janardhana's Monk, this does not mean that it cannot be pursued in integration with Balinese music heritage. The use of ombak as the main explorative element of a composition is of course an innovative approach from the local music perspective, but it continues to be strongly related to the core idea of Balinese tuning traditions.

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However, at the same time, going beyond his explicit intentions, considering that Janu refers to ombak just as a physical acoustic phenomena. I have to remember that his sonic reinterpretation of the ombak involves in any case a wider understanding of Balinese culture, especially if we consider music as a cultural product and not only as individual creation.

The ombak, as a purely aesthetic value, is interpreted as a direct manifestation of the Balinese Hindu philosophy of Rwa Bhineda, which is based on the balance of complementary opposites (e.g., male/female, black/white, visible/invisible, etc.) that for the Balinese imbue the universe with life and dynamism (Sukerta et al. 2019)

Some related question of course remain open. What are the implications for the Balinese gamelan heritage of new composition reinterpreting the concept of the ombak? How should consider the new categories of dualistic opposition exposed by Janu Janarhana's Monk? By this I mean, the new-born dualistic opposition of acoustic vs. digital sounds, tradition vs. modernity, gamelan vs. computer music...

At the moment, I cannot answer this question but it will be interesting to continue to explore these kind of implications on the field. Bibliography: Bandem, I Made. 2013. Gamelan Bali di Atas panggung Sejarah. Denpasar: Bp Stikom Bali. Blacking, John. 1973. How Musical Is Man? Seattle: University of Washington Press. Boon, James A. 1977. The Anthropological Romance of Bali 1597—1972. New York: Cambridge University press. Geertz, Clifford. 1973. The Interpretation of Cultures: Selected Essays. New York: Basic Books. Gluck, Bob. 2009. "Electronic Music in Indonesia". eContact! 11(3), Canadian Electroacoustic Community Institute. https://econtact.ca/ 11_3/indonesia_gluck.html (Retrieved 29.06.2021) Hobart, Angela, Urs Ramseyer, and Albert Leemann. 1996. The peoples of Bali. Cambridge: Blackwell. McGraw, Andrew Clay. 2013. Radical Traditions: Reimagining Culture in Balinese New Music. New York, Oxford University Press. Merriam, Alan P. 1964. The Anthropology of Music. Evanston, Ill.: Northwestern University Press. New Music For Gamelan, "Monk - Yan priya Kumara Janardhana (Janu): Audiovisual Spectrogram and Sonogram". Video YouTube. https://youtu.be/ELw9dUDR6cy (Retrieved on August 12th, 2021). picard, Michel. 1992. Bali: Tourisme Culturel and culture turistique. paris: Editions L'Harmattan. Ramseyer, Urs and I Gusti Raka panji Tisna (Eds.). 2001. Bali - Living in Two Worlds: A Critical Self- portrait. Basel: Verlag Schwabe + Museum der Kulturen Basel. Rembang, I Nyoman. 1984. Sekelumit Cara-Cara pembuatan Gamelan Bali. Denpasar: proyek pengembangan Kesenian Bali, Departeman pendidikan dan Kebudayaan. Steele, peter. 2013. Balinese Hybridities: Balinese Music as Global Phenomena. PhD diss. Middletown, CT: Wesleyan University. Sugiartha, I Gede Arya. 2012. Kreativitas Musik Bali Garapan Baru. Persfectif Cultural Studies. Denpasar UPT. Penerbitan Institut Seni Indonesia Denpasar. Sukerta, pande Made, I Nyoman Sukerna and Nanik Sri prihatini. 2019. "Rwa Bhinneda the Aestetics of Balinese Traditional Music". Arts and Design Studies 74: 40-46 Tenzer Michael. 2011. Balinese Gamelan Music. Berkeley: Tuttle Publishing. Vickers, Adrian. 1989. Bali, a Paradise Created. Ringwood, Vic.: penguin. Vickers, Adrian. 1996. Being Modern in Bali: Image and Change. New Haven: Yale Southeast Asia Studies. Ethnogrphic Interviews: Yan Priya Kumara Janardhan, interview by author. Tabanan 16/10/2019, 18/11/2019, 22/11/2019, 22/12/2020, and online 01/05/2021, 29/06/2021. I Wayan Gede Yudane, interview by author Denpasar. 21/09/2021, 06/12/2019, and Ketewel 10/12/2019.

