L2/10-267

Comments on L2/09-345, 10-062 and 10-154

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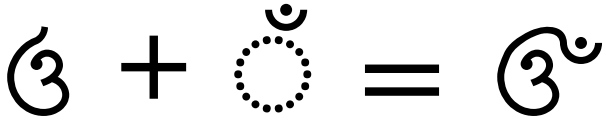
Naga Ganesan who has submitted a Grantha proposal (L2/09-141 and 10-345) has also submitted L2/10-062 and 10-154 in relation to Grantha. In this he has taken the opportunity to re-raise a few points regarding Grantha which he has repeatedly expressed strong opinions about. However, all native scholars I consulted, and hence I, have equally strong opinions that he is wrong on those matters.

I have already put forth logical arguments regarding these issues in my various documents L2/09-316 (my comments on Mr Ganesan's Grantha proposal), 09-372 (my own Grantha proposal) and 09-375 ("Further clarifications on Grantha virama ligatures"). However, I am informed that a Grantha OM and chillu marker have been included, as per Ganesan's request, in the list of Grantha characters being considered for encoding, despite the logical arguments that are against such characters. Therefore, I feel obligated to once more analyse Ganesan's documents and expose the absence of logic behind his opinions.

Grantha OM

In L2/10-062 pp 1 and 2, Ganesan has given screenshots from various websites that show various glyphs representing OM. While it is to be admitted that most of these glyphs are particular to a particular Indian script, Ganesan has provided no proof whatsoever that the glyph he has pointed out (and which admittedly has been repeatedly shown in the two screenshots) is *the glyph* that is used for OM in Grantha. Ganesan says that Dr Ajay Kumar of Kerala (not Delhi as Mr Ganesan says, see http://tdil.mit.gov.in/pdf/Grantha4.pdf) has "approved" the OM. However, even Dr Kumar has not supplied any samples to substantiate the usage of this written form in Grantha. When a particular written form is claimed to be a character belonging to a particular script, it would only be appropriate to provide attestion of such usage by providing samples from either (ancient) handwritten or printed material.

In fact, the character Ganesan suggests is the Grantha OM is the Oriya OM, as it is an evident ligature of 0B13 ORIYA LETTER O and 0B01 ORIYA CANDRABINDU:



The following sample from http://www.panoramio.com/photo/10405833 (retrieved 2010-Jul-28) also shows this glyph as used for OM in the Oriya script:

It is to be noted that Ganesan's samples nowhere mark his desired glyph as belonging to Grantha, but the sample above has clearly labeled the glyph in question as belonging to the Oḍiā (Oriya) script. Further, in Ganesan's Grantha proposal L2/09-345 p 17, he states (italics his with regular text my comments):

"The Grantha OM ligature is the one with O and M (anunasika) joined." In Grantha, there is no such ligature attested with O and M joined. The Oriya OM shown above is however indeed a ligature, but of the Oriya O and Oriya Anunasika Sign and not of Grantha written forms. In fact, it is clear that the Grantha O ligated with either the Grantha anusvara or Grantha anunasika sign cannot naturally produce Ganesan's desired character:

"The Grantha OM sign is well published, and is in manuscripts." Indeed, the Oriya OM sign may be well published, there is no objection to that. The sample provided above is also from

one such published material. Similarly, this character may also be in manuscripts. But those would be Oriya publications and manuscripts, not Grantha ones. Again I remind my readers that Ganesan has provided no real attestation for this character being used in Grantha.

"This Grantha OM sign is seen in temples, according to priests from Hindu temples in Chicago and New York." Those priests may be talking about the Oriya OM, not the Grantha one, since there is in fact no Grantha OM! *"Back in 1980s, I have personally seen this Grantha OM sign printed in papers such as India Abroad."* If this is indeed true, Ganesan must have seen this sign printed in the context of Oriya, not Grantha.

Ganesan's statements regarding the Grantha OM are mere unsubstantiated claims. This irks *real* native Grantha users because if such unattested characters are encoded (such as 0904 DEVANAGARI LETTER SHORT A and 0B82 TAMIL SIGN ANUSVARA) the quality of Unicode is degraded. In fact, this written form should be encoded, if at all, as the Oriya OM and not as the Grantha OM.

I do not understand how it is that Ganesan can ask for this character to be encoded as the Grantha OM. Either Ganesan knows that this is the Oriya OM or he does not. If he knows, then he cannot honestly ask for it to be encoded for Grantha. If he does not, then what caused him to think that it is the Grantha OM? If he is knowingly making claims that are contrary to or at least not based on truth, then his statements cannot be taken as authoritative.

The Government of India has also in no way endorsed Ganesan's claim. Dr Ajay Kumar of the Kerala IT Department has only remarked that there are new characters in Ganesan's proposal except the character in question. It is possible that Dr Ajay Kumar has seen this character *somewhere* (as an Oriya character, obviously) and that is why he does not identify it as a new character. Note that Dr Ajay Kumar has not said that this is a Grantha character.

Even if it is the Government of India proposing, they have an intellectual (and moral) responsibility to provide attestion for the characters they are asking for. Neither have they proposed a non-existing character such as a Grantha OM, nor endorsed one, nor provided attestation for one, and hence Dr Ajay Kumar's words should not be construed in that light.

Therefore the Grantha OM should be removed from the list of Grantha characters to be encoded and the corresponding codepoint 11350 should be kept reserved.

The Grantha virama problem, again

In L2/10-062 in p 3, Ganesan has once more raised the chillu issue. I have repeatedly pointed out that the word chillu is totally unknown to native Grantha-using scholars and experts. Please see p 3 of the document L2/10-233 submitted by me separately on behalf of the Grantha-using scholars of Tamil Nadu. Even scholars decorated with the President's award (Dr

S V Radhakrishna Shastri of Srirangam and Vidvan Shivaramakrishna Shastri of Tiruvanaikovil, both in their eighties and still active in their scholarly fields) whose signatures are included in that submission are not aware of even the existence of the word chillu.

Ganesan indicates that to use ZWJ to select virama ligatures (which is the proper name for the character forms in question, see my "clarifications" document L2/09-375) would be a problem and that it would be straightforward to use distinct characters to denote the (only two, according to him) distinct virama forms in Grantha. That is all well and good but it does not preserve the semantic equality between those forms.

Ganesan also possibly did not note the fact that in p 35 of my Grantha proposal L2/09-372 I have only indicated that the sequence ZWJ be used in conjunction with the LIGATING VIRAMA I proposed *to satisfy the requirement* that there exist some sequence that *unambiguously* selects a virama ligature. My argument all along as in fact been that to achieve the default appearance of a script one should not have to use unusual characters like a CHILLU MARKER or even a LIGATING VIRAMA. If my proposal is properly understood, it will be evident that even the LIGATING VIRAMA is there only to satisfy the abovementioned need. If this need is considered non-existent, then I have no objection to the non-encoding of a LIGATING VIRAMA as well. But my point is that a CHILLU MARKER (objectionable because it breaks the semantic equality of the various virama forms and objectionable because of the name which is unknown even to Presidential awardee scholars using Grantha) should not be encoded.

Ganesan further goes on to point out the "genetic" relationship between Grantha and Malayalam. This was never in question. However, I point out that even the Gurmukhi and Devanagari scripts are genetically related but the Gurmukhi script has certain characters such as Tippi and Addak which have no functional equivalent in Devanagari. Similarly, the chillu-s of Malayalam may perhaps serve distinct semantics in the writing of the Malayalam language but this is not true of the virama ligatures of Grantha.

Ganesan repeats that there are "only two viramas in the Malayalam and Grantha scripts" and that this fact is clear when one looks at any book describing Grantha. For one, Ganesan probably means to say "only two virama *forms*" and anyhow Ganesan has (again) not shown any passages from the authors he quotes to the effect that there are only two virama forms. Everyone knows that the proper procedure in such an academic context as a Unicode encoding proposal is to provide proper quotations and citations for such statements.

Ganesan says there is no need to encode a third virama called a touching virama but again it is obvious that Ganesan has not taken the care to read my documents properly because I have never proposed a touching virama. I have only pointed out that there are three

different virama *forms*, which is admitted by the scholars who have signed the petition I sent separately, and which is in fact non-conflicting with the words of Dr R Krishnamurti Shastri provided in p 66 of my proposal L2/09-372.

Ganesan says that the existence of touching virama forms is merely due to the carelessness of presses. However, I point out that first the scholars who signed the "request from scholars" document sent by me have admitted that these three different forms do exist. Many scholars in their personal handwritten Grantha (including me, but I will not quote myself as authority) do use these touching virama forms as distinct, especially in the matter of the repha, from the spacing virama forms. If needed, I will again get a separate endorsement from scholars to that effect.

Ganesan has once more used the adjective "prepausal" in connection with these so-called "chillus". I have shown in both my comments on Ganesan's Grantha proposal (L2/09-316 p 2) and in my own Grantha proposal L2/09-372 (pp 22, 23) that these virama ligatures are also seen in the middle of words and so are in no way "prepausal". Ganesan's repeated usage of this word indicates that Ganesan has not properly understood the nature of the script.

We Sanskrit/Vedic scholars of Tamil Nadu use this script daily in our reading and writing, and hence we are the "natives" as far as this script in concerned. Leave alone me, who am arguably biased towards my own opinion, but I point out that the *real* Grantha users, and the scholars and experts among them, including the Presential awardees, should be consulted before the encoding of any such "chillu marker" is considered.

In L2/10-154 §a, Ganesan says that he discussed the number of virama-s (again, it should be virama *forms*) "proposed" by me with a number of experts in universities and traditional scholars. However, Ganesan provides no names of those experts and "traditional scholars", who they are and where they are from, unlike my providing the full relevant details and qualifications of the traditional scholars I consulted in the "request from scholars" document that I sent. The UTC should be judge of which is the proper relevant procedure.

Ganesan yet again makes the mistake of speaking as if I have proposed the encoding of a separate touching virama. I would like to know what problem Ganesan has in understanding that I have only pointed out that there are three different *written forms* of vowelless consonants and thereafter discussed how these are to be unambiguously represented. There is no "touching virama", there is only a "touching virama *form*".

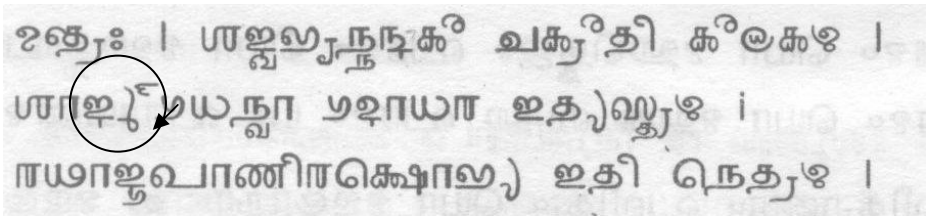
As for the quote from Dr R Krishnamurti Shastri, which Ganesan has astutely raised from my own proposal, I have discussed the matter with Dr Shastri, and it is agreed, as clarified by the scholars who signed the "request from scholars" document, that he has only

said “two” because glyphically the spacing and touching virama forms are highly similar and are *mostly* considered as one by those analysing the script, including perhaps the “experts” that Ganesan consulted.

I myself first did not consider the distinction between these two forms. It is only when I was going through some rare Vedic texts (from which I have provided samples on p 30 of my Grantha proposal L2/09-372, especially see the ones from ref 19) that I came across the repha being used with vowelless consonants wherein the repha came between the consonant letter and the virama that I started thinking that hitherto everyone’s analysis of “two virama forms” has been defective. It is not possible to consider the touching virama forms as mere cursive writing of the “regular” spacing virama forms because of the behavioural distinction seen in the matter of the repha. The proposals comparison document L2/10-053 authored by Deborah Anderson et al has very correctly identified this and mentioned it in p 10.

Not even Ganesan nor any other expert can refute the fact that this behavioural distinction exists. Since, by the very nature of Sanskrit grammar*, the actual number of places where the repha (nay, even any consonant cluster) occurs at the end of a word is highly limited, the actual number of places where this distinction is to be visibly seen is potentially very small. That does not however mean that this distinction does not exist.

Here is another sample from a Grantha primer, Kranta Lipi Ōr Aṟimukam, 2004, R Sridharan, Chennai showing the repha intervening between the consonant letter and its virama even in the middle of a word “śārṅgadhanvā” (an epithet of Viṣṇu):



I have not made claims without proof. The samples are there as the proof. The details of the publication from which samples are provided have been given in the references section (p 53) of my Grantha proposal L2/09-372 as also above. Any expert, including those who were consulted by Ganesan but whose names were not provided by him, may procure these printed texts and analyse for themselves whether the behavioural distinction between the spacing and touching virama *forms* exists or not.

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* The relevant Pāṇini-an aphorisms are *saṃyogāntasya lopaḥ* and *rāt sasya*. See Aṣṭādhyāyī 8-2-23 and 8-2-24 and the commentaries thereupon such as Mahābhāṣya, Siddhānta Kaumudī etc.

Therefore it is not entirely appropriate to consider the touching virama forms as cursive variants of the regular spacing virama forms.

As for Ganesan once more referring to "touching virama code point representations" what more can I say than that I feel that he has not at all understood my arguments properly. Has he not even seen the code chart and Unicode Character Properties listing in my proposal? I have repeated many times that I have never proposed a "touching virama code point".

As for differing from the Indic model, it is Ganesan whose "chillu marker" deviates from the Indic model. The chillu-s and their semantic distinctiveness are something peculiar to Malayalam. Perhaps they may be akin to the khanda-TA of Bengali, perhaps not – that is a different matter. It is however a foregone conclusion that there is no such semantic distinction between various virama forms (if such different virama forms exist in the first place) in the majority of Indic scripts (other than Malayalam and Bengali).

The Grantha script was evolved for the writing of Sanskrit, and in Sanskrit the meaning of words does not depend on the orthography, much less on the existence of various virama forms. If the meaning of Sanskrit depended on their existence, it would mean that the Devanagari script itself is incapable of properly representing Sanskrit, which is simply ridiculous. Sanskrit is written in many Indic scripts including Devanagari and Grantha, and all those scripts are equally capable of representing the language. This is one more reason why I have repeated that Sanskrit is a script-agnostic language. In the present matter, when Sanskrit is represented in Grantha, there should be no chillu marker producing virama ligatures, else it would deviate from the Indic model of representing Sanskrit without a "chillu marker".

It should be noted that the ligating virama I proposed was only to satisfy the theoretical requirement of having one sequence each to unambiguously represent the three different virama forms. To maintain the semantic equality I have asked for the ligating virama to be decomposable to the regular virama. Yet another option however comes to my mind now – using variation selectors. CONSONANT + VIRAMA by itself when isolated (i.e. not as part of a consonant cluster) will produce the default appearance, with the same followed by VS1, VS2 and VS3 being used one for each of the different forms. This way, one can avoid the usage of joiners altogether since there is the widespread opinion that excessive usage of joiners in Indic scripts causes confusion. Since the variation selections are default ignorable characters and are present only for glyph selection, they will still maintain the semantic equality.

I am not insisting on the encoding of a separate ligating virama character, unlike Ganesan who is insisting on the encoding of a chillu marker.

In L2/10-154 §b, Ganesan has listed a number of Grantha primers in which there is no mention of the "touching virama forms". It is not my fault if those books have not distinctly depicted these forms. I have not invented these forms. I have provided samples in p 21 of my Grantha proposal L2/09-372 for the existence of these virama forms, from the one Grantha primer which was not mentioned by Ganesan, viz: Grantha Bāla Pāṭhamālā, Heritage India Education Trust, Chennai, India, 2003, quoted in my proposal as ref 2. On p 35 of my proposal I have shown further samples of the touching virama forms from Vedic texts (see the two samples on the bottom left in the collage in the middle of the page). This being so, why does Ganesan speak as if I have invented these forms?

Why does Ganesan not consider the Grantha primer mentioned above and which clearly shows the touching virama forms? That primer is published by Heritage India Education Trust which is a very respected institution which has been consistently publishing and re-printing Grantha books related to Vedic subjects for over twenty years. It is headed by Dr R Krishnamurti Shastri who is a well known scholar decorated with high awards like the title Mahamahopadhyaya. I have provided further details about the qualifications of Dr Shastri in p 56 of my proposal. When Ganesan quotes Dr Shastri to show that there are only two virama forms, why does he not consider that the touching virama forms are seen in the Grantha primer published by that same Dr Shastri?

After providing all those references *not* showing the touching virama forms, Ganesan once more talks about "the newly proposed touching virama by Sharma". I do not need to repeat my previous remarks on this.

Ganesan points out that the chillus are separately encoded for the "closest genetic relative of the Grantha" script to Grantha, viz Malayalam. I do not contest that. I only point out that the Malayalam script is used to write Malayalam and due to the loss of the samvruthokaram from extant usage, the chillus came to have semantic significance. That was the justification of the encoding of separate Malayalam chillus.

The Grantha script is however used to write Sanskrit, and not Malayalam. In Sanskrit, there is no semantic difference between the various virama forms. (Yes, I am repeating myself on this.) This has been attested to by respected Sanskrit/Vedic scholars like Dr Krishnamurti Shastri. The respected recommendations committee has also taken note of this and in their document L2/10-167 p 3, they have quoted from Dr Shastri and recommended against the encoding of any chillu-s or chillu markers.

Despite this, I am informed that currently the list of Grantha characters to be encoded includes a chillu marker. I have asked to be informed of the reasons for this. If it is for Malayalam transliteration, then I will have to restate my already repeated objections:

If it is desired to add a 'chillu marker' to Grantha to enable it to denote a language that it was never intended to denote, i.e. retain the Malayalam chillu/virama semantic distinction, then why can this not escalate to the point where artificial characters are proposed for Grantha (for that matter for any other Indic or non-Indic script) to denote the Bengali Khanda TA, Tamil Āytam, Telugu TSA and DZA, Sindhi implosives, Limbu glottal stop, Gurmukhi Tippi and Addak, Sinhala prenasalized consonants etc, all of which are specific characteristics of a single Indic script, citing some possible need for transliterating these scripts into Grantha? It is obvious that such proposals would be meaningless.

As already stated in L2/09-316, a script may be extended to denote languages that are not native to it only in such a way as is really practically required, and that too in such a way as does not affect the way the script represents its native language(s) in the first place. A script may be used to represent words of languages non-native to it, but it is not required that it is *as capable as* the respective native scripts of those languages in that task.

In L2/10-154 §c, Ganesan has quoted authors to the effect that Malayalam is the closest genetic relative to Grantha. There is no objection to this evolutionary relationship. However, just as even human twins become quite different in nature, the Malayalam script, having lost its samvruthokaram, has gained semantic distinction in the Malayalam language between its virama forms. The Grantha script, dedicated to Sanskrit, has no such semantic distinction. Therefore there is no point in Ganesan repeatedly striving to prove the genetic relationship between Malayalam and Grantha, however true it may be.

In L2/10-154 §d, Ganesan says that the "touching virama" occurs in "old books" and not in modern printed books. First of all, the samples of touching virama *forms* that I gave were from the Grantha Bāla Pāṭhamālā and the Taittirīya Kṛṣṇa Yajur Veda, both published by the major Grantha publisher Heritage India Educational Trust. The printing of the Grantha primer from which I provided the samples dates to just 2003. The other Veda book is from 1980 and is still being reprinted as and when stocks deplete. This information may be verified from Dr R Krishnamurti Shastri if necessary. The relevant contact details are on the top of Dr Shastri's endorsement letter reproduced in p 66 of my proposal L2/09-372.

Further, books are not the only source. In handwriting, these touching virama forms are often used much more than the spacing virama forms, simply because of the convenience in cursive writing. This is something that only those in daily writing/reading habit of the

script can know. Therefore the statement "we do not find the archaic and rare touching virama nowadays" is totally false, at least in Tamil Nadu among the Vedic community and other *real* daily users of Grantha.

I should however point out that there is no need to demonstrate current usage of a particular character form to involve it in encoding. Even historic "archaic and rare" usage, which is however *attested*, is sufficient for encoding a character. Every person involved in Unicode encoding should know this. That said, the touching virama forms are indeed in current usage and therefore this argument need not even arise.

Next Ganesan quotes some Tamil scholars who, according to him, said that "joining calligraphy better be [sic] avoided". The reason for that was however not provided either by Ganesan or by those scholars. When something is attested, why should it be avoided?

Next he says that in Malayalam or Tamil there is no separate ligating virama code point. While that is true, he does not demonstrate how it has bearing on Grantha. Next, by calling the touching virama forms a "rare orthographic glyph variation", he says it would be "a major mistake to encode" it. First these forms are not rare. Even if they were rare, if they exist, then why not support them? Are there not rare characters encoded in Unicode?

Further, I have repeatedly said that the ligating virama was proposed only to satisfy a theoretical need for one unambiguous representation per virama form. Whether this need exists or not, the behavioural distinction of the touching virama form from the spacing one has been documented (while the glyphic distinction of the ligated virama form from the other two is obvious) and therefore there are indeed three different virama forms in Grantha.

Ganesan repeats the statement "in most modern Grantha books we do not find touching viramas at all". This statement is false, as proven above. He says "the touching virama, a rare occurrence in the 17th and 18th centuries should not be re-introduced in the Grantha script" without providing any reason why, even assuming that it was only used in that time period and is not used now. He says "just like touching virama-s are not re-encoded either for Malayalam or Tamil scripts". Ignoring the wrongly added prefix "re-" for "encoded", I point out that I myself wanted to *not* consider the cursive version of the virama as distinct, but am prevented from that by the repha issue.

"It will be a backward step", Ganesan says, but not how. "There is no semantic … difference" – true, I never claimed any. It is Ganesan that claims semantic difference for the so-called Grantha chillu-s even for Sanskrit. "There is no … significant orthographic difference" – *false*! Ganesan has ignored the repha issue. And I never had any intention of "introducing it with an atomic code point" – whatever that means. As for the "single

example", Ganesan ignores that in that single sample (p 21 of my proposal) there are many examples and further independent samples are given later (p 35). As for the "discrepancies mixed with non-touching virama-s" I point out that in p 21 I have clearly mentioned this saying "free variation with spacing forms" since it in fact strengthens the unity of meaning existing among the various virama forms which I have been emphasizing all along.

As for the touching virama-s being only "a very small subset" of consonants, it is highly ironic that Ganesan, who advocates the chillu marker to produce the so-called Grantha chillu which itself is not attested for all consonants, should say this. §5.3.3 of my proposal (pp 23 and 24) shows a comparative chart of the three types of virama forms and it is obvious that it is the ligated virama forms which Ganesan proposes the chillu marker for that are lacking, and that there exist touching virama forms for every single consonant.

"Nobody asks for a separate atomic codepoint for 'touching' Malayalam virama" says Ganesan, but he apparently does not understand, for whatever reason, that I have never asked for such a codepoint for Grantha. Without understanding any of the arguments that I have provided in favour of a separate ligating virama, which even I am willing to waive right now, Ganesan speaks all out against the ligating virama.

Ganesan appears to be bent on preventing the encoding of a ligating virama and ensuring the encoding of a chillu marker. Ganesan has not logically discussed in any of his documents the various possibilities of representing the existing written forms using encoded characters, unlike the various options that are always presented at the outset for handling situations by authors like Peter Constable (as in PR-37, the Bengali Khanda TA discussion etc), Nagarjuna Venna (as in the Telugu repha discussion) etc. I, however, have discussed different options of representing the various Grantha virama forms in my document L2/09-375. I am even willing to waive my request for a separate ligating virama, seeing as it is based only on a theoretical need, and seeing as the same can be accomplished by using VSs. I am however not willing to permit the encoding of a chillu marker which will break the way in which the Grantha script, ever since its birth hundreds of years ago, represents the Sanskrit language, the one and only language it was evolved to represent.

In L2/10-154 §e, Ganesan calls my method of "creating chillu consonants" "complicated". First there are no such things as "chillu" consonants in Grantha. There are only virama ligatures. Ganesan should use terms that are already used by or at least are unobjectionable to the native Grantha scholarly community. The usage of the Malayalam term chillu in the context of Grantha is unacceptable because it implies that there exists a semantic difference between the various virama forms in Grantha, which is totally false.

Next, Ganesan has still not understood that this particular sequence which I have provided is only for the *unambiguous* selection of the ligated virama form. Ganesan has totally ignored the fact that I have been insisting all along that the *default representation* of the script should be achieved without the usage of even a single joiner (for example see bottom of p 33 of my proposal). Therefore this statement of Ganesan is totally unwarranted and misleading.

Ganesan asks "why not [sic] this be simplified as CONSONANT + CHILLU MARKER". If Ganesan had been reading my documents as well as I have been reading his, he should understand that the reason is that the semantic equality between the different virama forms in Grantha should be maintained. If the same chillu marker were to be renamed as a ligating virama and provided a decomposition to the regular virama, then I would have no objection to there being such a character that CONSONANT + THAT CHARACTER produces a virama ligature. Ganesan says "like the parallel Malayalam case" but I have refuted the parallel, since the semantic equality/distinction factor still exists.

In L2/10-154 §f, Ganesan says that in my documents one reads "that chillu prepausal consonants be [sic] treated as default". Wherever in my documents did Ganesan read this? Why does Ganesan not provide proper section/page/line numbers? Did Ganesan not read the following passage from pp 34, 35 of my proposal where I say: "in the case of the virama forms of Grantha, the plain sequence CONSONANT + VIRAMA should be left free to be rendered as the font maker or user pleases to achieve their desired default expected behaviour"? Ganesan further says: "Forcing all Grantha pure consonants as chillus is problematic and unwarranted". If Ganesan misquotes me, what am I to do? Ganesan's statements call to my mind the well-worn Sanskrit phrase *abaddham paṭhitvā kucodyaṃ karoti* ("First misreads the text and then asks improper questions"). While I have tried to keep this discussion from degrading into a personal argument, I am not willing to let Ganesan even try to get a Sanskrit-semantics-crippling chillu marker into the Grantha encoding by his ill-formed arguments.

Ganesan goes on to say that "the three virama-s, including a newly invented touching virama code point, and extensive use of joiners, and chillu viramas as default will be very confusing and become [sic] hard to teach the Grantha script among Tamils".

First of all, there are no "three virama-s". There are only three virama *forms*, and I did not invent them. I am only analysing the existing script, and the native Vedic/Sanskrit scholars here in Tamil Nadu, two of whom are Presidential awardees, agree that the same vowelless consonants can be equally and equivalently written in all three forms. The document I have separately submitted with the signatures of those scholars (with more

signatures to come in the near future after I attend the next convention of Vedic scholars at the end of this month) is proof of the native scholars approving my analysis.

Anyway, those three forms exist, and going by Unicode's standards w.r.t Arabic ligatures, Bengali vowel-sign ligatures etc, it is normal that different sequences using joiners are prescribed to unambiguously request each of the available options. As I have mentioned above, there is also the possibility of using VSs, which can be implemented as:

C + VIRAMA (when isolated)	→	Default virama form desired for C
C + VIRAMA + VS1	→	Spacing virama form
C + VIRAMA + VS2	→	Touching virama form
C + VIRAMA + VS3	→	Ligating virama form

which totally avoids the problem of joiners, is therefore straightforward (two qualities that are said in favour of the chillu marker model) and also preserves the semantic equality between the various virama forms.

Next, there is no "newly invented virama code point". Enough said on this.

Neither is there no "extensive use of joiners". Again, should be clear.

As for "chillu viramas as default", I already commented on this.

Ganesan should also remember that the Unicode implementation of the script is something that is quite different from, albeit based on, the script itself. Therefore, "teaching the script among Tamils" is not dependent on the encoding. Perhaps Ganesan means the teaching of the *usage* of the script *in computers based on Unicode*, but that is common to all people who wish to use Grantha in computers, and not particular to the Tamils. And it will in fact be confusing only in Ganesan's model, not mine, because to achieve the default appearance of isolated vowelless consonants – which according to the chosen typographic/ orthographic style can be a mixed selection of spacing, touching and ligated virama forms – one needs to use two distinct characters, viz the default virama which according to Ganesan should only stand for the spacing virama form, and the "chillu marker" for the ligated virama form. The touching virama form – which is to be seen even in modern books despite Ganesan's claims to the contrary – is left without a representation in Ganesan's model.

In the summary to L2/10-154, Ganesan argues that "it is better to have a similar encoding model between Malayalam and its closest relative Grantha" because "Sanskrit is very often written in Malayalam script". I point out that at both the national and international level, Sanskrit is more often written in the Devanagari script than in the Malayalam script. The usage rate of Devanagari for Sanskrit is so high that those not accustomed to accurate speaking call the Devanagari script the "Sanskrit script", especially in South India. This being

so, it is more important to have equivalence of the Grantha script with the Devanagari script than with the Malayalam script. This equivalence can only be maintained if there are no different viramas that are mutually semantically distinct since that is so in Devanagari.

To the extent possible, the encoding of more than one character that is used to "kill" a consonant should be avoided. If at all necessarily, they should all decompose to a single character. However it is possible that the whole concept of decomposition was not originated with this kind of semantic equivalence in mind. In that case, the usage of VSs as suggested before is the possible option. It also avoids the encoding of more than one vowel killer for Grantha and provides a straightforward mechanism to handle the glyphic differences.

The possibility of using VSs to represent the various mutually semantically equivalent virama forms of Grantha had unfortunately not occurred to me till now. If the UTC sees in favour of this, appropriate VS sequences may be defined to render the appropriate virama forms. Otherwise, the whole matter may be dropped with no particular sequences being defined for making unambiguous choice among the different virama forms per consonant for Grantha. In any case, a chillu marker which is objectionable on many counts as repeatedly described above, should *not* be encoded, as was recommended in L2/10-167. The way in which Grantha represents Sanskrit should be accurately preserved by any model of encoding Grantha in Unicode. This is the request of all Vedic/Sanskrit scholars in Tamil Nadu using the Grantha script from generations upon generations.

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