

Chanda Nikasha (Naga-Pingala)

Verification and Identification of meters in Kannada Prosody

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Chanda Nikasha is an online application to verify and recognize meters (*chandassu*) in Kannada and Sanskrit prosody. It is based in the Nagavarama's Chandambudhi. Nagavarama was 10th century poet, writer, and grammarian. All the meters mentioned by Nagavarma are included in this application. Additionally, a few select meters (mainly, *sama vrittas*) mentioned in Pingala Sutra are also encoded.

Who can use?

- Scholars and Researchers:**
 - To identify meters;
 - To identify corrupt text in old handwritten manuscripts;
 - To recognize mistakes and get clues to correct them; and
 - To identify most probable *pathantaras* (text variants)
- Poets:**
 - To verify a poem confirms to a specified meter; and
 - As a tool for experimenting with new meters and constructing new poems
- Students:**
 - For learning to write metrical poetry in a classical or custom meter
- Teachers:**
 - For constructing questions papers and verifying students' works

Features

Two main functions of the application are verification and recognition. A complete support for verification that the verse is according to the meter and constraints is provided. Secondly, the application can identify the most probable meter for the verse.

Verification

- Built in repository of over 45 Kannada (and over 200 Sanskrit) *chandassus*
- display *prastara* for a poem for a specified *chandassu* (verification)
- Show errors in *matras*, *ganas*, and *prasas*
- specify a custom *chandassu* - with *matras*, *ganas*
- supports *matra-gana*, *akshara-gana*, *amsha gana*, and their mixture
- Specify conditions or constraints e.g, 7th *matra* must be a guru, total *matras* in a line must be 20, 6th *ganas* must be Brahma *gana*, syllables in line 1 must be exactly 16, etc

Recognition

- recognize the (most probable) *chandassu* of a given poem

A Heuristic, based on lines, *ganas*, and *matras*, is employed for the measure of confidence in the identification of the meter.

User Interface

The User Interface is a single screen consisting of three sections. First two sections are the inputs and the third is the output. In the middle is the button to cause the function to execute.

As shown in Figure 1. The first section ❶ is the ಪದ್ಯ (pady) (verse) input box where the user types in (pastes) a verse whose *chandassu* is to be verified or recognized.

Second section ❷ specifies the ಭಂಡಸ್ಸು(*chandassu*) and optional conditions. A built in *chandassu* is specified by using the selection dropdowns. There are two special options for the *gana*:

1. Selecting the ವಿನಾಸ (vinyasa) allows one to specify a custom *chandassu* (*matra-gana vinyasa*) in the area below.
2. Selecting the ಗೊತ್ತಿಲ್ಲ (*gottilla*) allows one to recognize a (probable) *chandassu* for the given verse.

Optionally, using the check boxes, *prasa* (rhyme) (*adi* and *antya*), and *lagam*, can be specified. Checking the *Sharattu* (condition/constraint) will open a subsection where the user can type in additional constraints to be verified.

The ನಿಶ್ಚಯ *nikashisu* button is pressed to verify or recognize the *chandassu*.



ಚಂದ್ರ ನಿಕಷ (ನಾಗ-ಪಿಂಗಲ) :
ಕನ್ನಡ ಚಂದ್ರಸ್ಸು ಪರಿಶೀಲನ ಮತ್ತು ನಿರ್ಣಯನ
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ಪದ್ಯ:

ಕೂಡೆ ಸಲಹಲಿ; ಕೂಡೆ ಸವಿಯೆ,
ಕೂಡೆ ಗಳಿಸುತ ಬಲ ತಿಳಿವನು,
ತಿಳಿವು ಬೆಳಕಿನಲಿ ನಾವ್ ಮೀಯೆ
ಇರದಿರಲಿ ತಪ್ಪು ತಿಳುವಳಿಕೆ.

1

ಚಂದ್ರಸ್ಸು

ನುಡಿ	ಗಣ	ಜಾತಿ	ಮಟ್ಟ	ಆದಿ	ಅಂತ್ಯ	ಲಗಂ	ಪರಮ್
ಕಂನುಡಿ	ವಿನ್ಯಾಸ			☐ ಪ್ರಾಸ	☐	☒	☐

___ ಗಣ ವಿನ್ಯಾಸ ___

5 | 5 | 3ymtr
jbns-uu | u-uBVR

2

ನಿಕಷಿಸು

ಪ್ರಸ್ತಾರ್

3

ತಪ್ಪು ತೋರಿಕೆ: ಮಾತ್ರ ಕಡಿಮೆ | ಮಾತ್ರ ಹೆಚ್ಚು | ಅಕ್ಷರ ಕಡಿಮೆ | ಅಕ್ಷರ ಹೆಚ್ಚು
ಮಾತ್ರ ಹೊಂದಿಕೆ ಇಲ್ಲ | [] ಪ್ರಾಸ ತಪ್ಪಿದೆ | [] ಲಗಂ ದೋಷ | [X] ಪರಮ್ ನವಾಸು | [✓] ಪರಮ್ ವಾಸು

Figure 1: Chanda Nikasha User Interface

The third section 3 is the output ಪ್ರಸ್ತಾರ(prastara). This is the verse with *matra* and *gana* divisions marked. Errors and defects are marked in various colors indicating deviations from the chandassu specified in section two.

If recognition were requested by selecting ಗೊತ್ತಿಲ್ಲ(gottilla) in section 2, also shown in section 3 are probable matching *chandassus* and the confidences. This is illustrated in Figure 4

If ಪರಮ್(sharattu) were selected, as shown in Figure 2, a subsection 4 opens up where the conditions/constraints can be specified; Another subsection 5 will show the pass/fail status of each specified condition.

ಚಂದಸ್ಸು

ಮಡಿ
ಗಣ
ಜಾತಿ
ಮಟ್ಟ
ಅಡಿ
ಅಂತ್ಯ
ಅಗಂ
ಪರಮ್ತ

ಕಂನುಡಿ

5|5|3ymtr

jbns-uu|u-uBVR

ಗಣ ವಿನ್ಯಾಸ

ಪರಮ್ತಗಳು

S1G2M3 != u

ನಿಕಷಿಸು

ಪ್ರಸ್ತಾರ

Figure 2: Chanda Nikasha User Interface - conditions

Error Markings

Errors and defects in verification of the meter occur due to more or or less *matras*, *ganas*, or syllables in the verse than required by the specified *chandassu*, and other requirements such as *prasa*, *lagam*, and *sharattus*. These errors and defects are marked or highlighted in the *prastara* with different colors as shown in the table below. An example is shown in Figure 3.

<matramore>	Light Pink	There are more <i>matras</i> in the verse than required by the <i>chandassu</i> .
<matraless>	Yellow	There are less <i>matras</i> in the verse than required by the <i>chandassu</i> .
<syllablemore>	+ Light Grey	There are more <i>akshara</i> (syllables) in the verse than required by the <i>chandassu</i> .
<syllableless>	Light Blue -d	There are less syllables in the verse than required by the <i>chandassu</i> . <i>d</i> indicates the deficit <i>matra/gana</i>
<matramismatch>	Khaki	Matra in the verse does not match the <i>matra</i> specified in the <i>chandassu</i> .
<prasaerror>	b	(Adi/antya) <i>prasa</i> error
<lagamerror>	u	<i>u</i> - <i>Lagam</i> error
<sharatererror>	✗	Fail, condition is not met
<sharatererror>	✓	Pass, condition is met

Table 1: Error Marks



ಭಂಡ ನಿಶಿಷ (ನಾಗ-ಪಿಂಗಲ) :
ಕನ್ನಡ ಭಂಡಸ್ಸು ಪರೀಕ್ಷಣ ಮತ್ತು ನಿರ್ಣಯನ
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ಪದ್ಯ:

ಧಪ್ಪರಿ ಧಟ್ಟುಂ ಪೊಟ್ಟೆ
ಧೊಪ್ಪ ಧೊಗಪದಪನೆ ದಿಧೀಲ್ ಬುಧಿಲ್ಲನೆ ಮೆಯ್ಯಳ್ಗೆ
ಸೊಪ್ಪು ಸೊವಡಪ್ಪಿನಾಂ ಸೂಟ್
ತಪ್ಪದೆ ಕಡುಕೆಯ್ ಪೊಯ್ಯರೊವರು

ಭಂಡಸ್ಸು

ನುಡಿ	ಗಣ	ಜಾತಿ	ಮಟ್ಟು	ಅಡಿ	ಅಂತ್ಯ	ಲಗಂ	ಪರತ್ತು
ಕಂನುಡಿ	ವಿನ್ಯಾಸ			☒ ಪ್ರಾಸ	☐	☒	☒

___ ಗಣ ವಿನ್ಯಾಸ ___

4 | 4 | 4
4 | 4 | 4 | 4 | 4

___ ಪರತ್ತುಗಳು ___

ಸಾಲು ೨ ಕೊನೆಗೆ ಗುರು : MATCH(S2) = .*-
Line 3 Gana 2 : MATCH(S3G2) = u-u

ನಿಶಿಷಿಸು

ಪ್ರಸ್ತಾರ

ಧಪ್ಪರಿ| ಧಟ್ಟುಂ| ಪೊಟ್ಟೆ|
||ಧೊಪ್ಪ ಧೊ|ಗಪದಪ|ನೆ ದಿಧೀ|ಲ್ ಬುಧಿಲ್ಲ|ನೆ ಮೆಯ್ಯ|ಳ್ಗೆ|
||ಸೊಪ್ಪು ಸೊ|ವಡಪ್ಪಿ|ನಾಂ ಸೂ|ಟ್
||ತಪ್ಪದೆ| ಕಡುಕೆ|ಯ್ ಪೊಯ್ಯ|ರೊವರು|-4|*

✗ ಸಾಲು ೨ ಕೊನೆಗೆ ಗುರು : MATCH(S2) = .*-

✓ Line 3 Gana 2 : MATCH(S3G2) = u-u

ತಪ್ಪು ತೋರಿಕೆ: ಮಾತೆ ಕಡಿಮೆ | ಮಾತೆ ಹೆಚ್ಚು | ಅಕ್ಷರ ಕಡಿಮೆ | ಅಕ್ಷರ ಹೆಚ್ಚು
ಮಾತೆ ಹೊಂದಿಕೆ ಇಲ್ಲ | || ಪ್ರಾಸ ತಪ್ಪಿದೆ | || ಲಗಂ ದೋಷ | ✗ ಪರತ್ತು ನಪಾಸು | ✓ ಪರತ್ತು ಪಾಸು

Figure 3: Example of Error Markings



ಛಂದ ನಿಕಷ (ಢಾಗ-ವಿಂಗಲ) :
ಕನ್ನಡ ಛಂದಸ್ಸು ಪರಿೀಕ್ಷಣ ಮತ್ತು ನಿರ್ಣಯನ
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ಸಹಾಯ Help ಸಂಪರ್ಕ

ಪದ್ಯ:

ಎಲ್ಲಿ ಯೋಗದ ಎರೆಯ ಕೃಷ್ಣ
ಎಲ್ಲಿ ಬಿಲ್ಲಿನ ವೀರ ಪಾರ್ಥ
ಅಲ್ಲಿ ಸಿರಿ ಗೆಲುವು ದೃಢ ನಿಲುವು
ವಿಕಸನವು ಎಂದೆನ್ನ ಮತವು

ಛಂದಸ್ಸು

ನುಡಿ	ಗಣ	ಪಾತಿ	ಮಟ್ಟ	ಆದಿ	ಅಂತ್ಯ	ಲಗಂ	ಪರಮ್
ಕಂನುಡಿ	ಮಾತ್ರಾ	ಅಯ್ಯತಿ	ಅಯ್ಯತಿ	☐	☐	☒	☐

ಗಣ ವಿನ್ಯಾಸ

[5|5|5|5|5|5 / 5|5|5|5|5 / 5|5|5|5 / 5|5|5 / 5|5 / 5] |
[3 / 2 / 1]?

ನಿಕಷಿಸು

ಪ್ರಸ್ತಾರ

ಎಲ್ಲಿ ಯೋಗದ ಎರೆಯ ಕೃಷ್ಣ
ಎಲ್ಲಿ ಬಿಲ್ಲಿನ ವೀರ ಪಾರ್ಥ
ಅಲ್ಲಿ ಸಿರಿ ಗೆಲುವು ದೃಢ ನಿಲುವು
ವಿಕಸನವು ಎಂದೆನ್ನ ಮತವು

ಒಪ್ಪಬಹುದಾದ ಛಂದಸ್ಸುಗಳು

[ನುಡಿ: ಗಣ: ಪಾತಿ: ಮಟ್ಟ: ಅಳವಿ]

ಕಂನುಡಿ:ಮಾತ್ರಾ:ಅಯ್ಯತಿ:ಅಯ್ಯತಿ: 100%

ಕಂನುಡಿ:ಮಾತ್ರಾ:ಅಯ್ಯತಿ:ಅಯ್ಯತಿ ರೂಪಕ: 100%

ಕಂನುಡಿ:ಮಾತ್ರಾ:ಚೌಪದಿ:ಆಟಗೀತೆ: 86%

ತಪ್ಪು ತೋರಿಕೆ: ಮಾತ್ರ ಕಡಿಮೆ | ಮಾತ್ರ ಹೆಚ್ಚು | ಅಕ್ಷರ ಕಡಿಮೆ | ಅಕ್ಷರ ಹೆಚ್ಚು
ಮಾತ್ರ ಕೂಂದಿಕೆ ಇಲ್ಲ || ಪಾಸು ತಪ್ಪಿದೆ | ಿ ಲಗಂ ದೋಷ | ✗ ಪರಮ್ ನಶಾಸು | ✓ ಪರಮ್ ಪಾಸು

Figure 4: Result of Meter Identification

Custom Meter

A custom meter can be specified using

- 1,2, ...9 for a *matra gana*,
- y, m, t, ... s for an *akshara gana*,
- B, V, and R for an *amsha gana*,
- u, -, and x for *laghu*, *guru*, and *any* (*guru* or *laghu*, don't care)

Optionally a *gana* separator | can be used between the *ganas*.

Alternate *ganas* are specified by enclosing them in square brackets separated by /. For example, specifying [4/V/y/-uu-], a *gana* in the *padya* will match any one of the 4, V, y, -uu *gana*

A *gana* is considered optional if followed by “?”; An unmatched optional *gana* is not considered an error and disregarded.

Examples of Chandassu Specification

Kagga	5 5 5 5 5553 5 5 5 5 5551
Bhamini Shatpadi	3434 3434 343434x
Utpala male	brnbbru-
Doreyakkara	VVBVVB
Kanda	[--/-uu/uu-/uuuu] 4 [--/-uu/uu-/uuuu] 4 [--/-uu/uu-/uuuu] [u-u/uuuu] [--/-uu/uu-/uuuu][uu/--]
Condition	Line 2 ends in - : S2=.*-
Madanavati	[VVVVR/RRRV-]
Condition	Line ends in - : S1=.*- Line ends in - : S2=.*-

Table 2: Chandassu Specification Examples

Examples of Sharattu Specification

- 15th_gana_of_padya_is_brahma: G15 = B
- 3rd_saalu_4th_gana: S3G4 = uu-x
- 3rd_saalu_last_matra_is_guru: S3 = .*- or MATCH(S3) = .*-
- Tripadi S3 must have 13 matra value: MVALUE(S3) = 13
- Anushtup shloka S2G1 must not be x-u-: MATCH S2G1 != x-u-
- Shloka line 1 has 8 syllables: count(S1) = 8
- In the second saalu, 3rd gana should be B and 5th gana should be V of
MATCH(S2) = G02BGG01VG.*
or simply break it into two conditions
MATCH(S2G3) = B
MATCH (S2G5) = V
- A complex example

Say your padya of Mandanila Ragale meter has 4 lines 4 ganas each. A condition to check that no gana begins with u-

lagam-varjya: MATCH(P) = ((-|uu).*GS?){16}

or MATCH(P) = ((?!u-).*GS?){16}

Matra Overrides in the verse

The application automatically determines the *laghu* (*u*) and *guru* (-). However, it can be overridden manually in the verse using *u*, - and ~ symbols after a syllable.

- A *u* (-) after a syllable forces it to be *laghu* (*guru*). E.g ಮುದ್ದಾನೆ- in the verse will be rendered as ಮದ್ದಾನೆ.
- A ~ after a syllable will consider it a *shithila-ottu* (loose conjunct) and may make the previous syllable a *laghu*. For example,
 - ನುಸುಱ್ಱಿ~ is rendered as ನುಸುಱ್ಱಿ, whereas
 - ಅಮದರ್ಱಂ~ ಮುಕ್ಕುಳಿಪಂತುಟಪ್ಪ is rendered as ಅಮದರ್ಱಂ ಮುಕ್ಕುಳಿಪಂತುಟಪ್ಪ

Note: When a syllable becomes a *laghu* on account of the next syllable being marked as *shithila-ottu*, it is shown with (*shithila-guru*) ^ symbol in the *prastara*

Grammatical Definition of Chandassu

<chandassu>	::=	<chandassu-saalu> <EOL> <chandassu-saalu>
<chandassu-saalu>	::=	<gana> <chandassu-saalu> <gana-separator> <gana>
<gana>	::=	<maac-gana> <alt-gana> <optional-gana>
<maac-gana> :	::=	<matra-gana> <amsha-gana> <akshara-gana> <custom-gana>
<optional-gana>	::=	<gana> "?"
<alt-gana>	::=	<alt-begin> <maac-gana-seq> <alt-end>
<maac-gana-seq>	::=	<maac-gana> "/" <maac-gana-seq>
<matra-gana>	::=	"1" "2" "3" "4" "5" "6" "7" "8" "9"
<amsha_gana>	::=	"B" "V" "R"
<akshara_gana>	::=	"y" "m" "t" "r" "j" "b" "n" "s"
<custom_gana>	::=	<matra> <custom-gana>
<gana_separator>	::=	" "
<alt-begin>	::=	"["
<alt-end>	::=	"]"
<matra>	::=	<guru> <laghu> <any>
<guru>	::=	"_"
<laghu>	::=	"u"
<any>	::=	"x"

Table 3: Chandassu Specification

Grammatical Specification of Sharattu (Condition)

<sharattu>	::=	<shart-lhs> <shart-not>{0,1} "=" <sharat-rhs>
<sharat-lhs>	::=	<sharat-name>{0,1} <sharat-function>{0,1} <sharat-param>
<sharat-function>	::=	<sharat_fncount> <sharat_fnmatch> <sharat_fnmatraval>
<sharat_fncount>	::=	"count" (<laghu> <guru> <any> "m") <s-saalu><s-gana>
<sharat_fnmatch>	::=	"match" ""
<sharat_fnmatraval>	::=	"mvalue"
<sharat_fnparam>	::=	<sharat_target> "(" sharat_target ">")"

sharat_target	::=	<prastara>{0,1} < prastara_saaluu>{0,1} < prastara_gana>{0,1} < prastara_matra> {0,1}
<prastara>	::=	[pP]
<prastara_saaluu>	::=	[sS]<digit>{0,2}
<prastara_gana">	::=	[gG]<digit>{0,2}
<prastara_matra>	::=	[mM]<digit>{0,2}
<sharat-not>	::=	"!"
<sharat-rhs>	::=	(<digit>{0,1}<digit>{0,1} <sharat_regex>)
<sharat_regex>	::=	a regular expression using the literals 1. u (laghu), 2. - (guru), 3. x (any matra u -) 4. B, V, R (amsha ganas), 5. y...b (akshara-ganas) 6. \1 ... \6 (matra ganas), 7. S (saalu separator, end of line), 8. G (gana separator, end of gana), and 9. regex meta characters such as . ? * () { } [] etc.

Note 1: S (G) matches any unmatched matras before and the Salu (gana) separator \n (|).

Note 2: your regex is always enclosed between ^ and ([GS])*\$. in other words, your regex must entirely match the selected target from beginning to end

Resources

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