

Using Musical Information

MUSIC 253/CS 275A 1B

STANFORD UNIVERSITY



1. Classifying Data Domains

Visual domain

- scores, parts

Aural domain

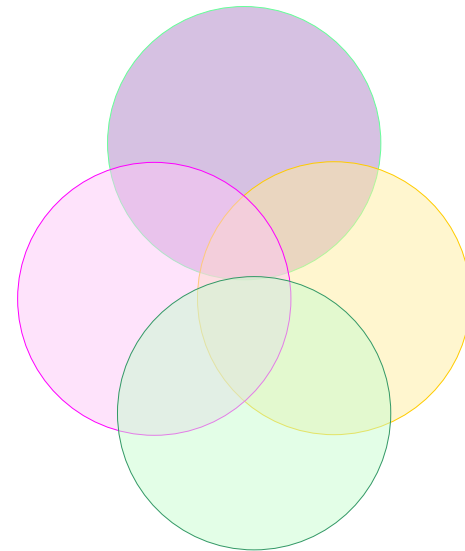
- performances, recordings

Logical domain

- analytical data sets

Cognitive/perceptual domain

- how we hear/understand music



2. Granularity of information

Data for **interchange**

Data for **classification**

A comparison of three view modes:



Satellite View



Blend View



DEM View

Data for **form** analysis

[Click image for a larger view](#)

A comparison of different resolution:



20km resolution



1km resolution

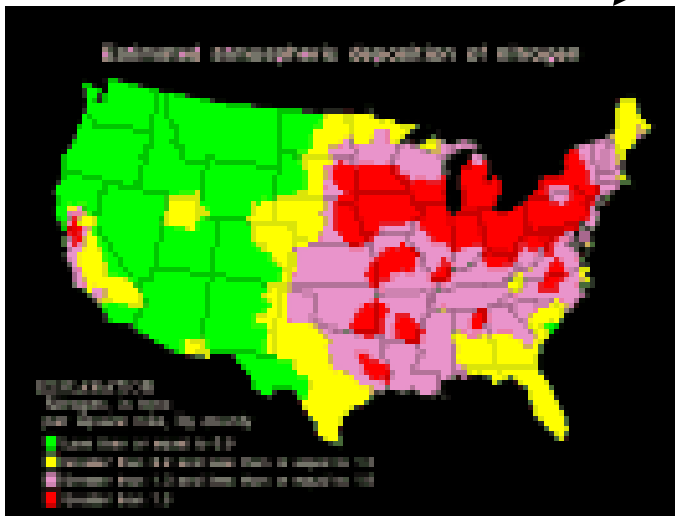


50m resolution

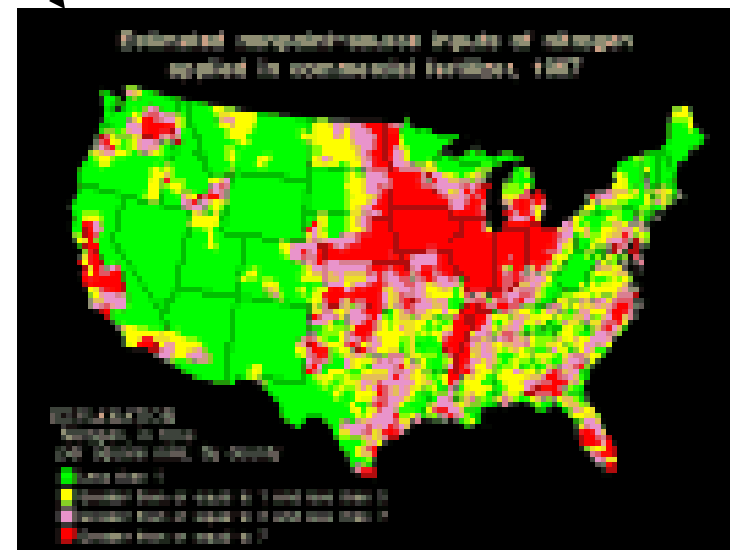
Data for **feature** analysis

3. Information for comparison

Entity: the US



Identity #1:
The **atmospheric** nitrogen map of the US
Background=US

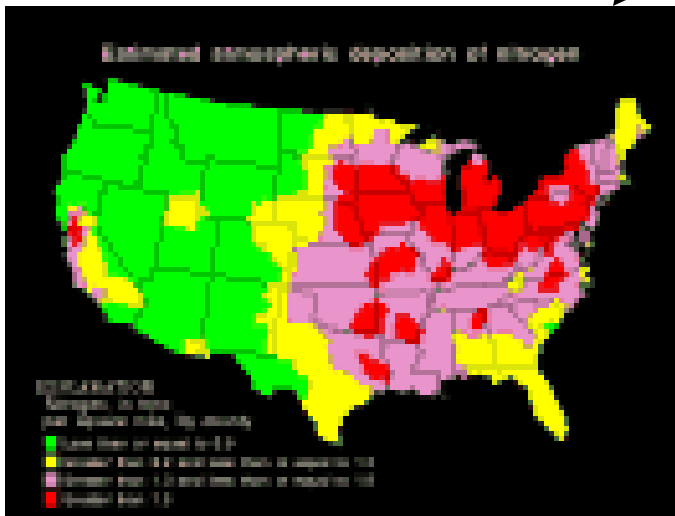


Identity #2:
The **ground** nitrogen map of the US
Background=US

3. Information for comparison:

What is in the foreground?

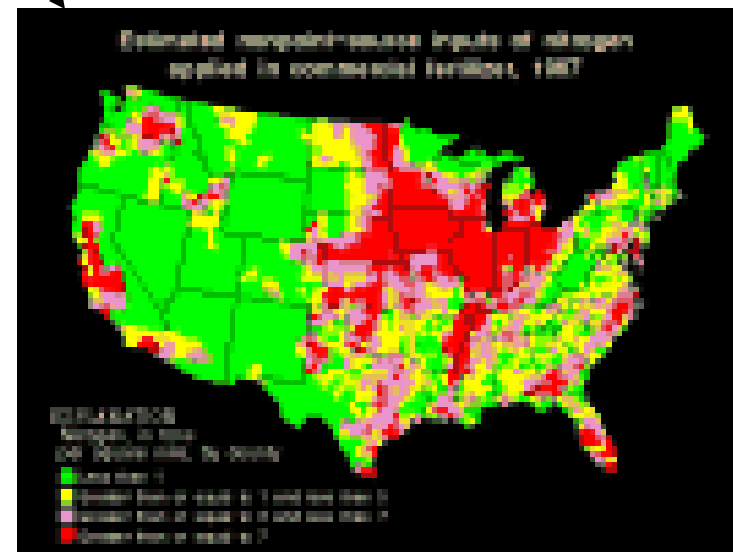
Entity: the US



Identity #1:

The **atmospheric** nitrogen map of the US

Background=US



Identity #2:

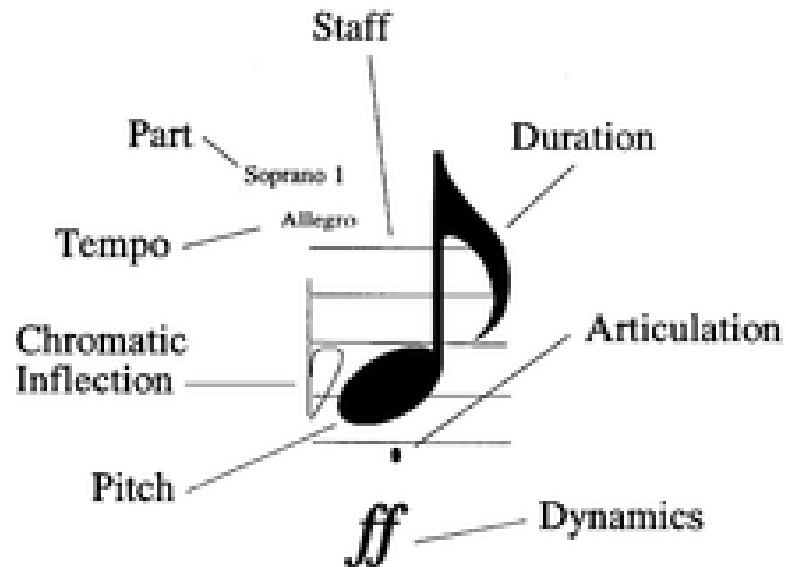
The **ground** nitrogen map of the US

Background=US

4. Musical features of one note

**Many features used
only selectively**

Violin



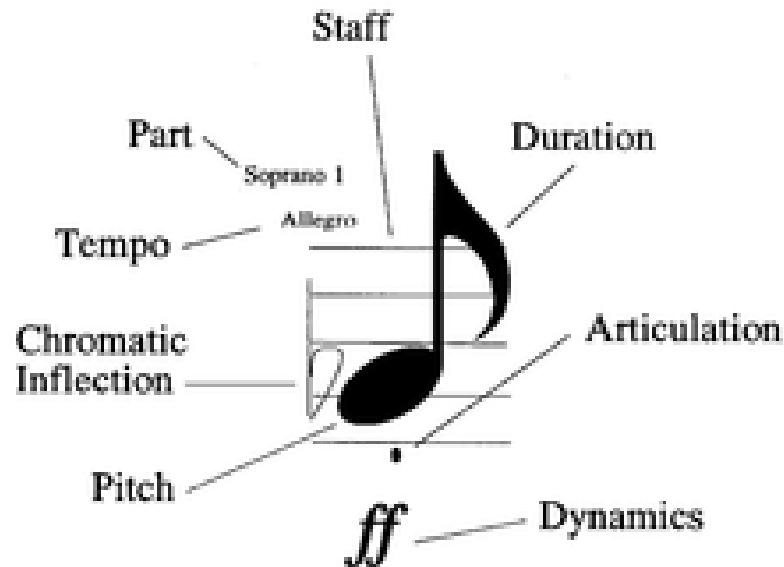
4. Musical features of one note

Many features used only selectively

Two are **fundamental**:

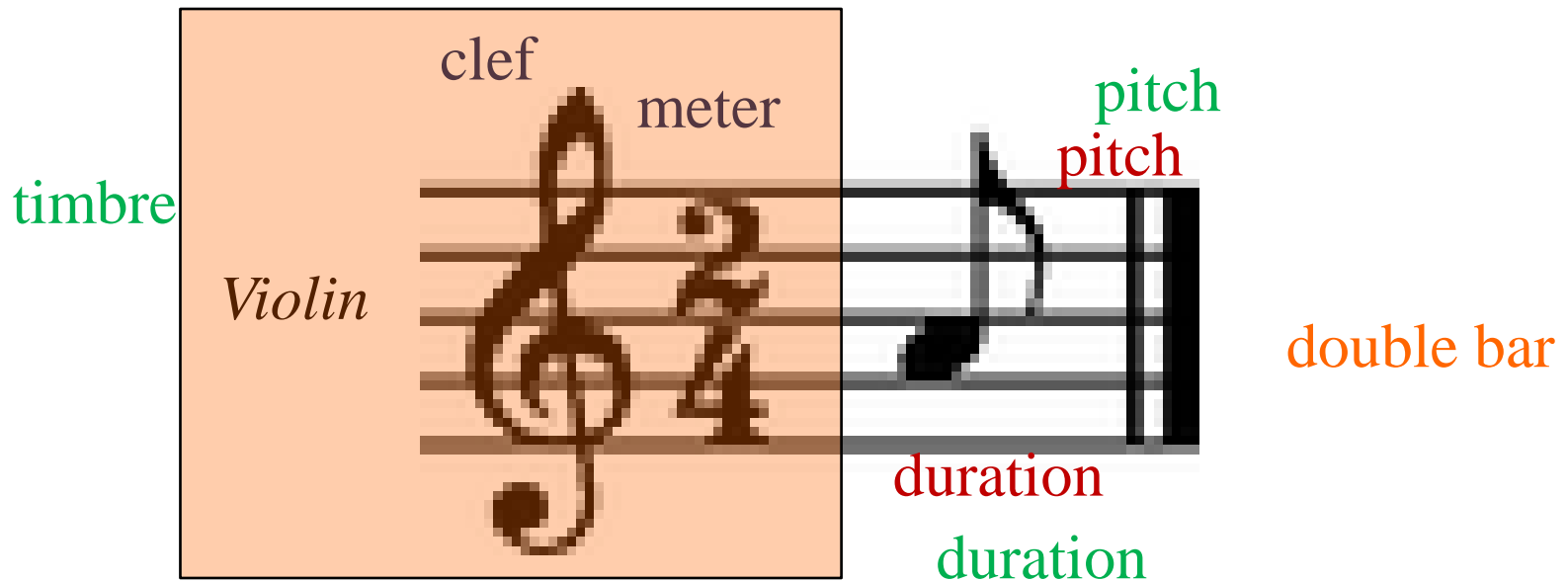
Pitch
Duration

Violin



4. Musical features of one note

Contextual information (**notation**)



Contextual information (**metadata, aural ambience**)

5. Musical features by domain

Articulation

Example 1

Sopran

The musical score is written on a single staff in 4/4 time. It begins with a treble clef and a key signature of one sharp (F#). The first measure contains a quarter rest, followed by a quarter note on G4 with a 'cresc.' dynamic marking and a 'v' (accents) symbol above it. The second measure contains a half note on G4 with a 'fff' dynamic marking and a fermata above it, with the number '2' above the note. The third measure contains a quarter note on A4 with a fermata above it and the number '3' above it. The fourth measure contains a quarter note on B4 with a fermata above it. The fifth measure contains a quarter note on C5 with a fermata above it and a 'p' dynamic marking below it. The sixth measure contains a quarter note on D5 with a fermata above it and a '*' symbol below it, with the number '4' above it. The score is enclosed in a dashed box.

Dynamics, Gesture

5. Domain conflicts (symbols vs sound)

Continuous vs static features

Articulation: many sound events prescribed in one symbolic figure

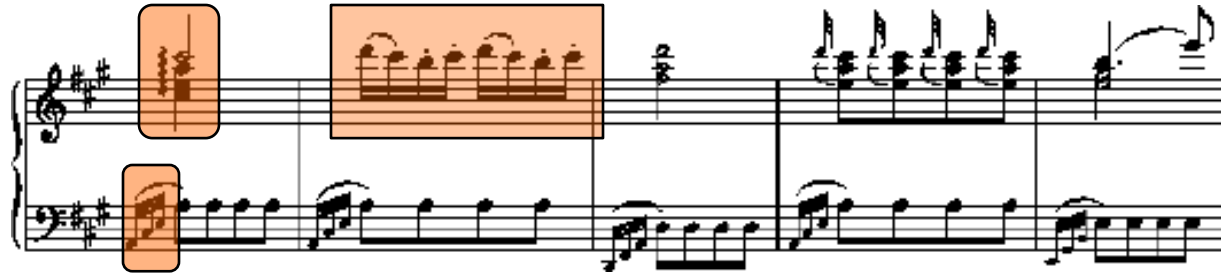
Example 1

The image shows a musical staff for Soprano in 4/4 time. The staff contains the following notes and markings: a quarter note G4 with a fermata, a quarter note A4 with a fermata, a quarter note B4 with a fermata, a quarter note C5 with a fermata, a quarter note B4 with a fermata, a quarter note A4 with a fermata, and a quarter note G4 with a fermata. Above the staff, there are four numbered annotations: 1. A symbol resembling a section sign (§) and an accent (>) above the first note. 2. A fermata symbol above the second note. 3. A fermata symbol above the third note. 4. A fermata symbol above the fourth note. Below the staff, there are two orange boxes. The top box contains the first four notes and is labeled 'Example 1'. The bottom box contains the last four notes and is labeled 'cresc.', 'fff', 'Ped.', and a star symbol (*). The staff is labeled 'Sopran' on the left.

Dynamics, Gesture: reduced to symbols in writing but may operate on continuum

6. Data beyond time (*Beyond MIDI #2*)

Time-stealing “durations”



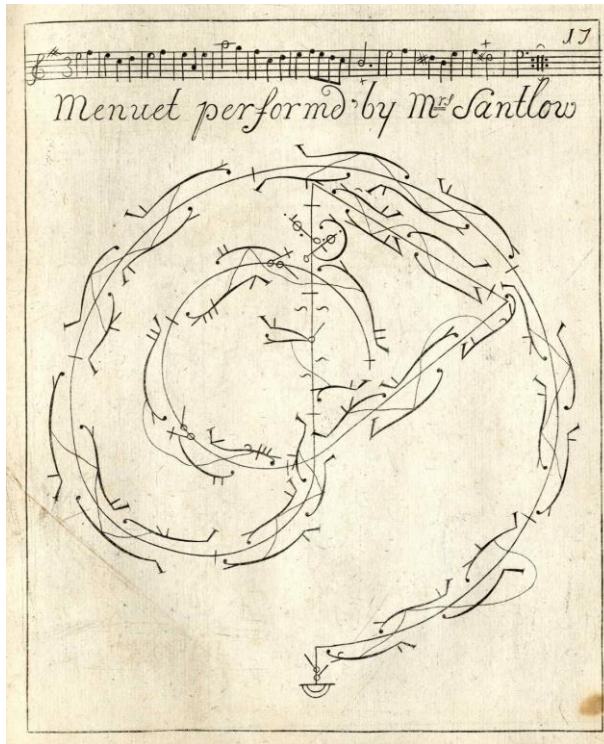
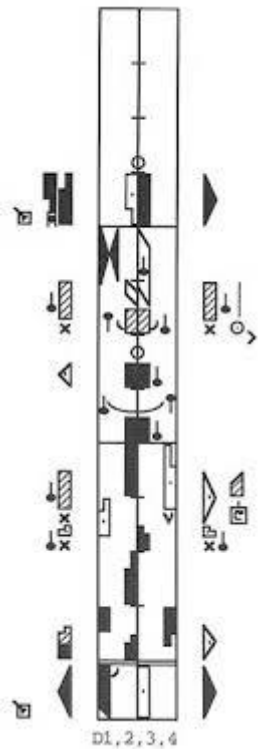
Arpeggios

Grace notes (single, multiple)

Staccatos

7. Gestural data (examples)

Choreography: (L) Labanotation, (M) French dance c1700, (R) Ballet



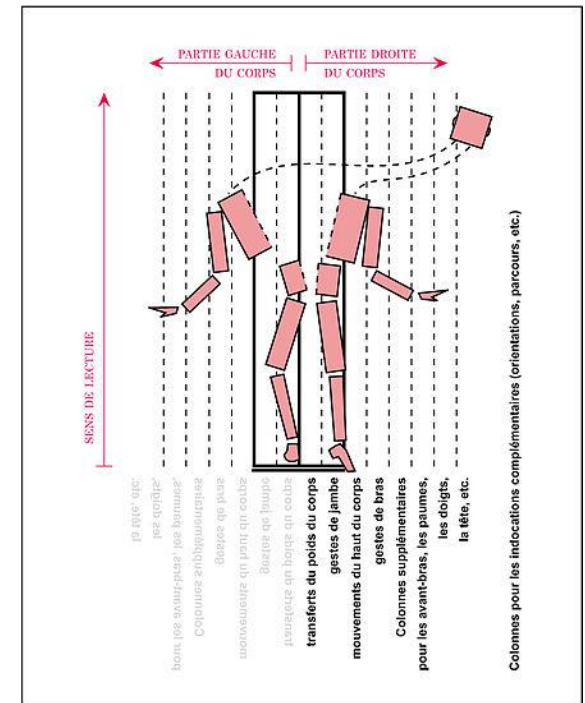
Blue Bird, Male Solo
"Sleeping Beauty," Act III
Choreography: after Petipa
Music: Tchaikovsky
Cut bars 47 to 54

Allegro (Tempo di valse)

A musical score for a male solo from the ballet Blue Bird. The score is in 3/4 time and is marked 'Allegro (Tempo di valse)'. It consists of five staves of music. The first staff begins with a '3' indicating a triplet. The score includes various musical notations such as notes, rests, and dynamics. There are also choreographic annotations, including arrows and symbols, indicating movement directions and timing. The score is numbered '3' at the end of the fifth staff.

Labanotation

- Rudolf Laban (1879-1958), Hungarian
- Aimed to study dance in a “scientific” way through Laban movement analysis
 - Labeling parts of the body

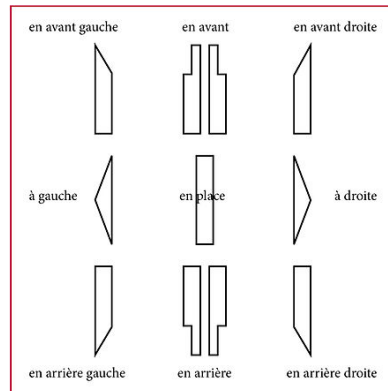
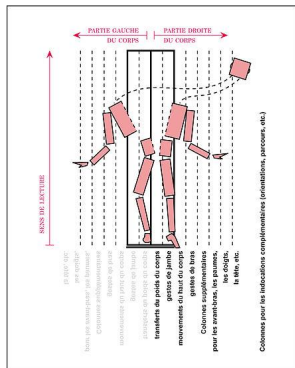


Labanotation

- Rudolf Laban (1879-1958), Hungarian
- Aimed to study dance in a “scientific” way through

Laban movement analysis

- Labeling parts of the body
- Basic directional signs
- 27 directional signs (3D)



Direction Signs
Die Richtungszeichen
Les signes de directions

Level Ebene Niveau	F = forward B = backward L = to the left H = right D = deep P = in place	V = vor Z = zurück L = links R = rechts H = hoch T = tief P = am Platz	Av = en avant Ar = en arrière Dl = à droite G = à gauche H = en haut B = en bas P = en place
high hoch haut	LBH LZH AvGH	LH LH GH	FH VH AvH RH RH DnH
medium level mittelhoch niveau moyen	LH LH G	LH LH G	FH VH AvH RH RH DnH
low niedrig bas	LD LT GB	LD LT GB	FD VT AvB RD RT DnB

8. Score organization

Types 1a, 1b (*Beyond MIDI* #1)

Score-major systems

Part-major systems

Page-traversal dilemmas

The image displays a musical score snippet illustrating score organization. The top system is a score-major system, where the staves are grouped by instrument: clarinet in A, violino I, violino II, viola, and violoncello. A vertical yellow bar highlights a specific measure across all staves, demonstrating how a single measure is spread across multiple systems. The bottom system is a part-major system, where the staves are grouped by part: strings (violin I, violin II, viola, cello) and piano (piano). A vertical black bar highlights a specific measure across all parts, demonstrating how a single measure is spread across multiple systems. The page-traversal dilemma is highlighted by the fact that the highlighted measure in the part-major system spans across two systems, while the highlighted measure in the score-major system spans across five systems.

9. Score organization

Type 2 (*Beyond MIDI #2*)

The “grand staff”



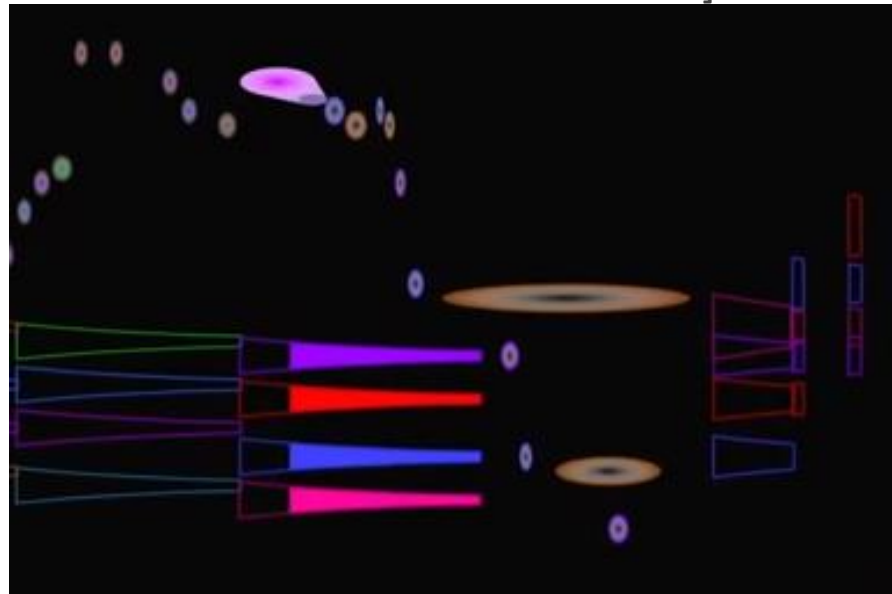
The grand staff as a **single instrument**

10. Sound features **not** in notation

Sound decay

<http://www.youtube.com/watch?v=WdGQuITuwiQ>

[from Stephen Malinowski's Music Animation Machine]



11. The GUIDO *NoteServer* (ASCII input)

Developed by Holger Hoos et al at the Fraunhofer Institut, Darmstadt, 2000-04]

The screenshot shows the GUI of the GUIDO NoteServer. At the top, there is a zoom control set to 50%. Below it, a text box labeled '3. Stored data' contains the ASCII notation: `[c0/4 d0/4 e0/4 c0/4 c0/4 d0/4 e0/4 c0/4]`. Underneath is a '2. Symbol' section with icons for note heads (quarter, eighth, sixteenth, dotted), rests, and accidentals. A numeric keypad shows octaves from -1 to 3, with '1' selected. Below the symbols is a '1. Sound' section with a piano keyboard. At the bottom, there are buttons for 'rest', 'send', 'auto load' (checked), and 'page settings'.

Find method for entering: pitch, inflection, octave

<http://www.noteserver.org/>

Guido input: Pitch and Duration

Feature definition and grouping

Data

representation
stored

Note duration

Note prolongation

Octave number

Pitch inflection

Pitch (key no.)

The screenshot shows a software interface for entering musical notation. At the top, a zoom level of 50% is indicated. Below that, a text input field contains the Guido notation: `[c0/4 d0/4 e0/4 c0/4 c0/4 d0/4 e0/4 c0/4]`. The title "Frere Jacques" is centered below the notation. The main area features a piano keyboard with a red box highlighting the first five notes (C, D, E, C, D) and a blue box highlighting the next two notes (E, C). A red box highlights the first note of the second measure (C). Below the keyboard, a control panel includes a "rest" button, a "send" button, a checked "auto load" checkbox, and a "page settings" button. The time signature is set to 4/4. The measure numbers 48, 60, and 72 are marked at the bottom.