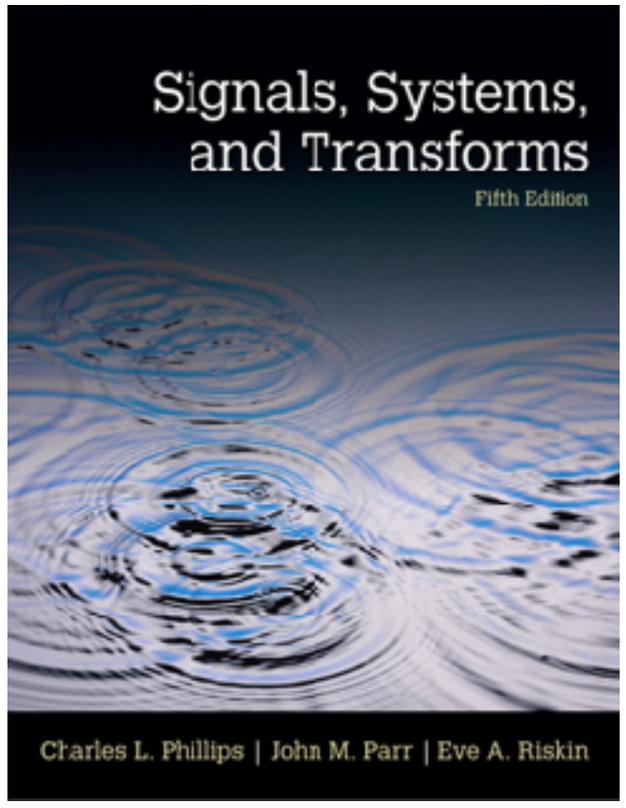
EE103:Signals and Systems

Course Instructor: Prof. Sung-Mo (Steve) Kang
Email: skang@ucsc.edu
Office hours: tbd, BE 239

Time: MWF 1:20 -2:25 pm
Location: Steven Acad 175



Textbook: L. Phillips, J. Parr and E. Riskin "Signals, Systems and Transforms" (5th Edition) Prentice Hall
-eCopy 180 days Rental: VitalSource

Course website: ee103-fall17-01.courses.soe.ucsc.edu

- All lectures/HW/solutions will be posted on our web site
- The lecture is now posted at webcast.ucsc.edu

U: ee-103 P: 7774

Midterm: Wednesday, November 1, 1:20 -2:25 pm (closed book, no calculators)
Final Exam: Tuesday, December 12, 4:00–7:00 p.m (closed book, no calculators)

Tentative Grading

Quiz	20%
Midterm	30%
Final	50%

- Homework will be assigned for each week
- Homework is not collected
- Each student is responsible to solve them
- Solution will be posted on course website
- There will a 15 minutes Quiz on Mondays
  -one problem chosen from the assigned HWs (with modified parameters)

- 2 TA office hours every week at BE 224
- TA office hour poll URL: goo.gl/wD5Tnq

EE103L: Signals and Systems Laboratory (not mandatory for all taking EE103)
Course website: canvas.ucsc.edu
#Labs starts today (September 29th) Ming Ong Comp lab/Merrill college

Disability Resources:
Contact the Disability Resource Center (DRC) to request an Accommodation Authorization
459-2089 (voice), 459-4806 (TTY), http://drc.ucsc.edu

- Bring your DRC form to course instructor, after class or during office hours or send via email
- For lab sections (EE103L) please let your TA know about your accommodation needs.

EE103, Fall 17, Section 01

SIGNALS AND SYSTEMS

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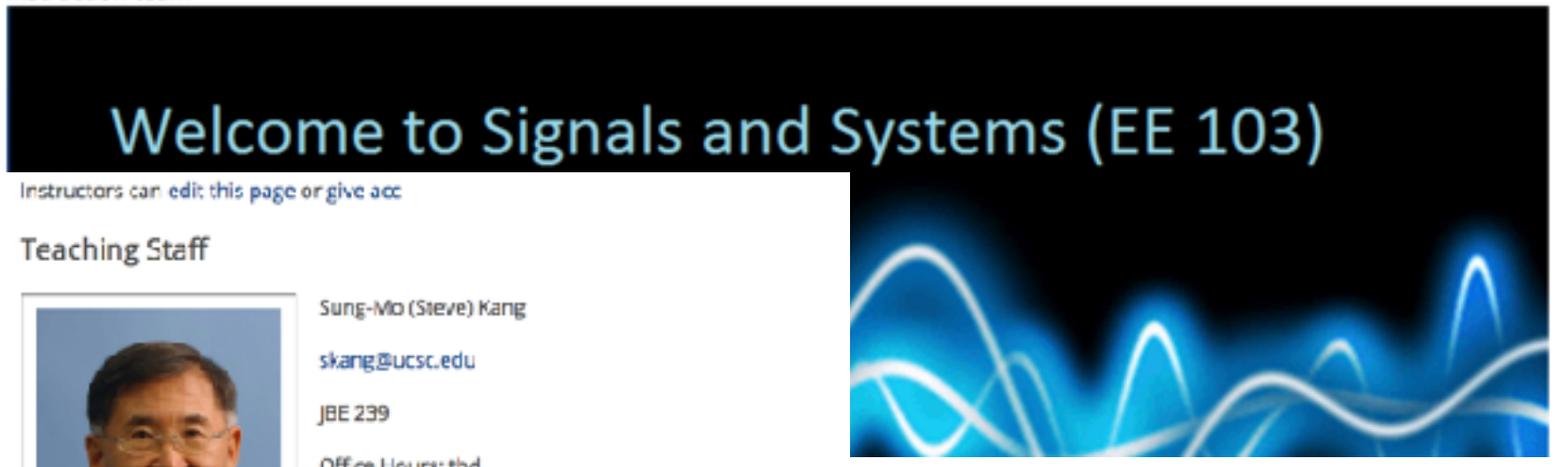
instruction team



Instructors can edit this page or give acc

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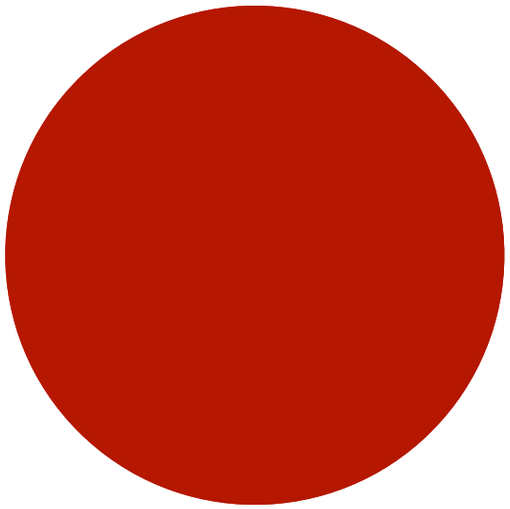
If you need help using this web site, please send an e-mail to webmaster@soe.ucsc.edu.

Attachment	Size
EE103Fall2017_LecturePlan	35.75 KB

make sure to log in to access secured uploads/ course materials

Log In

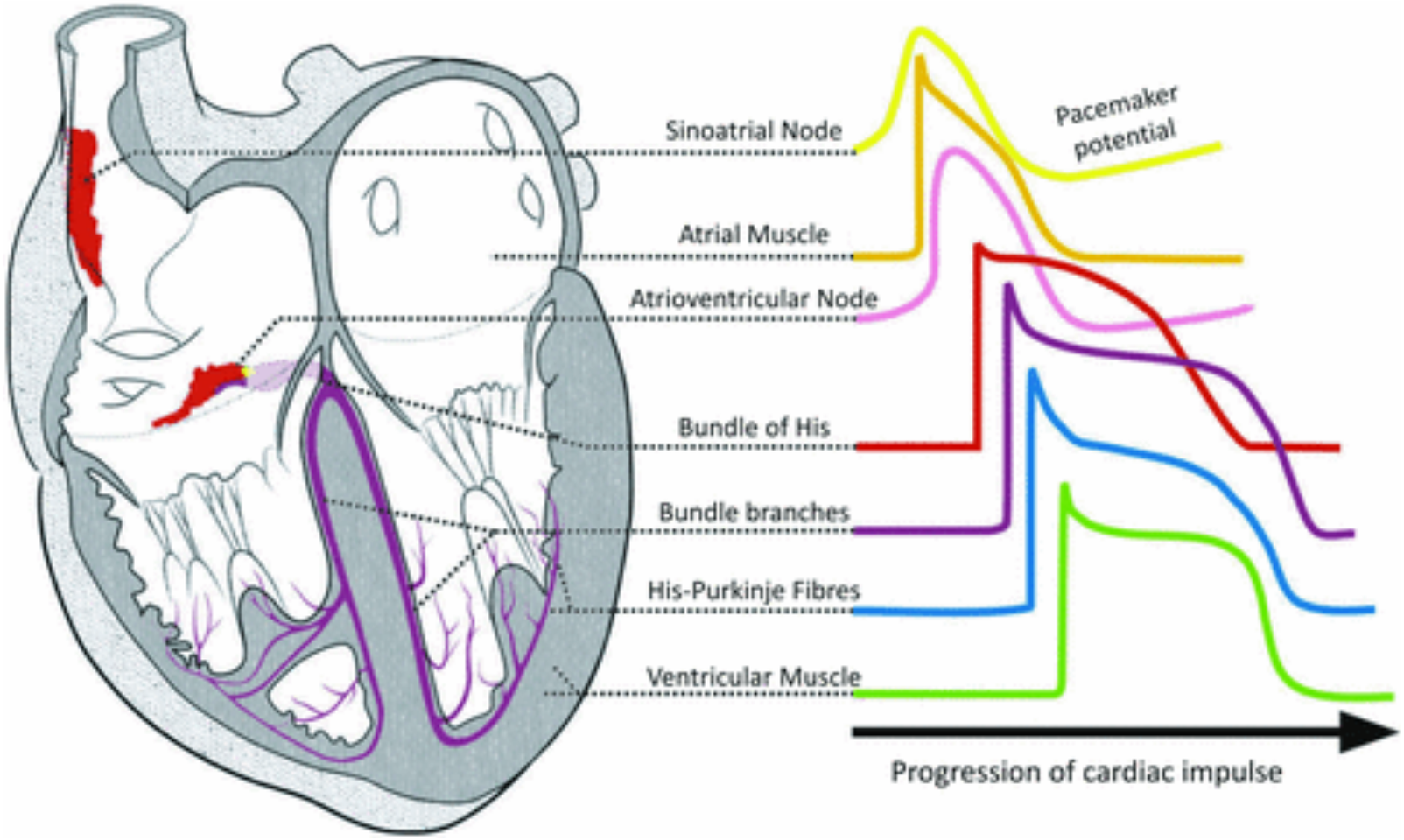


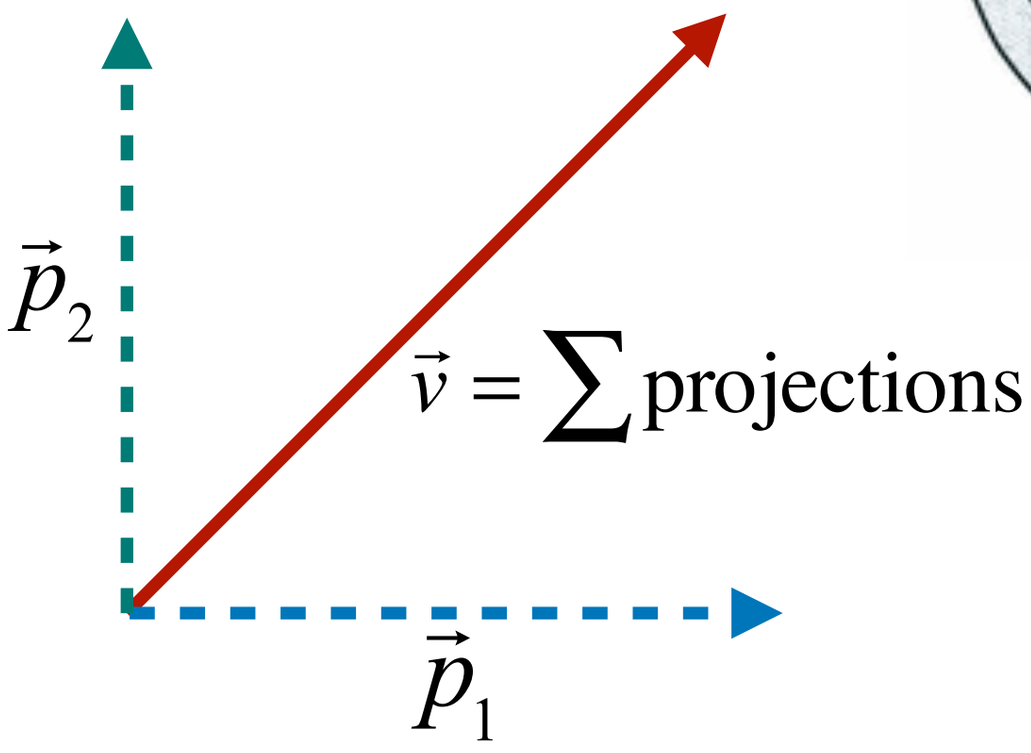
variation in time

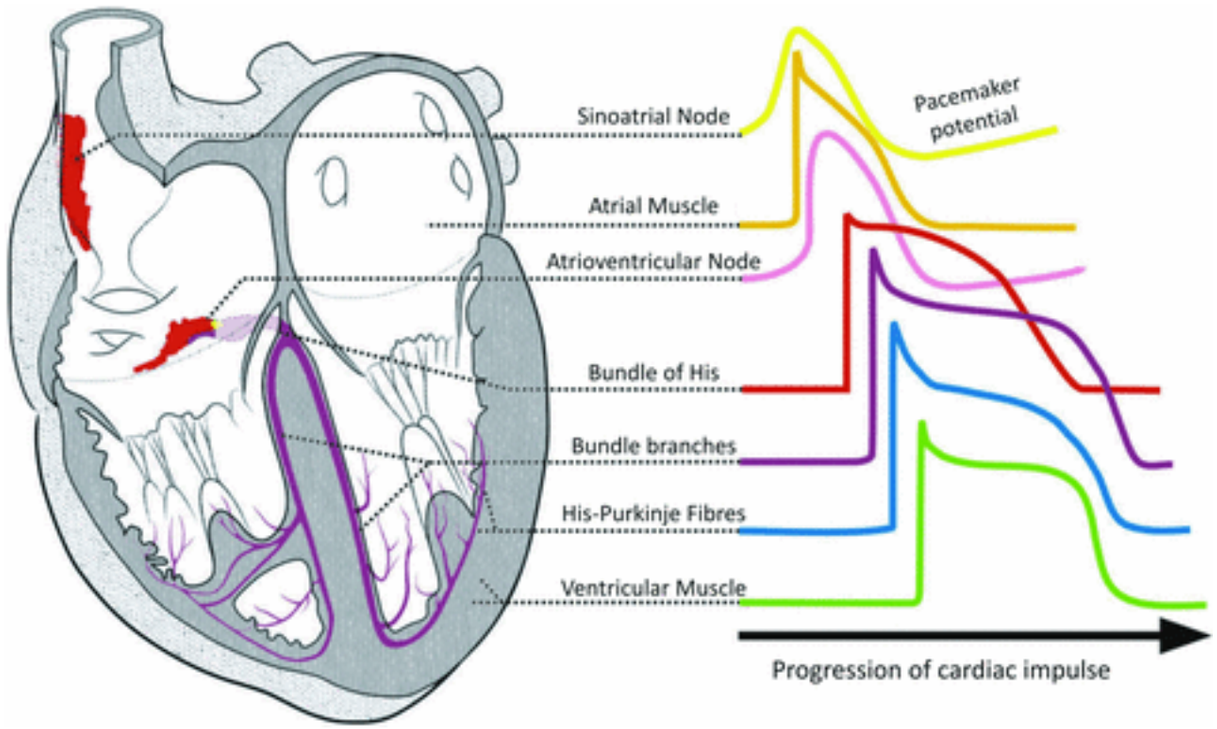
variation in space

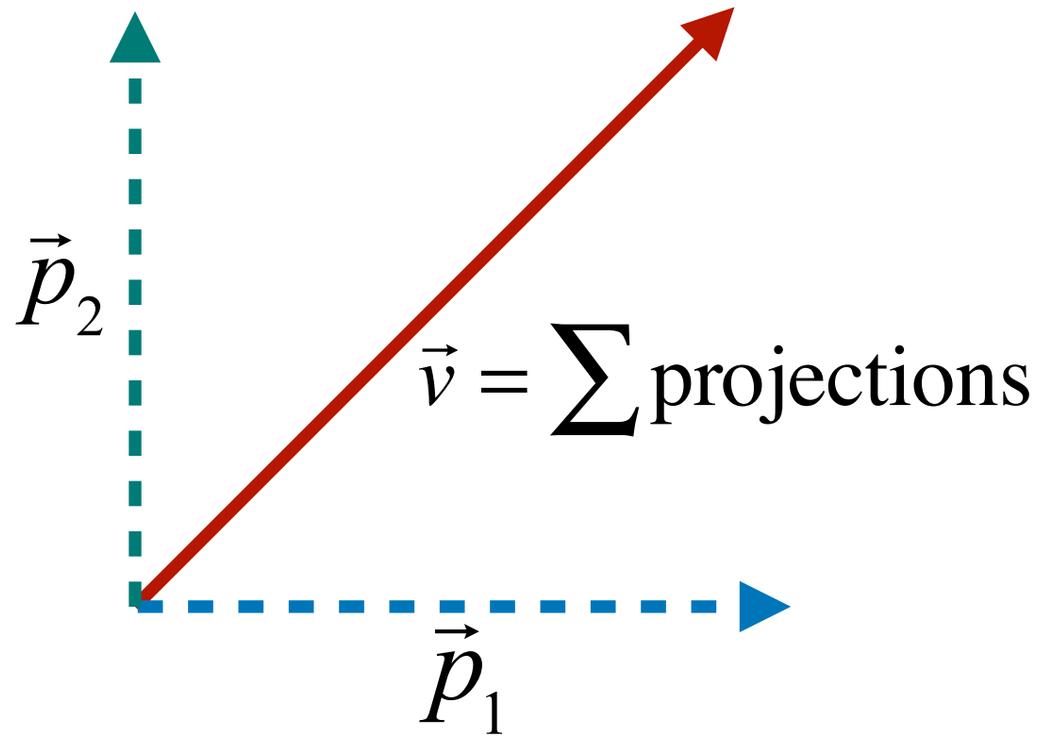
- Signals are functions of independent variables (e.g. time, space) that carry information

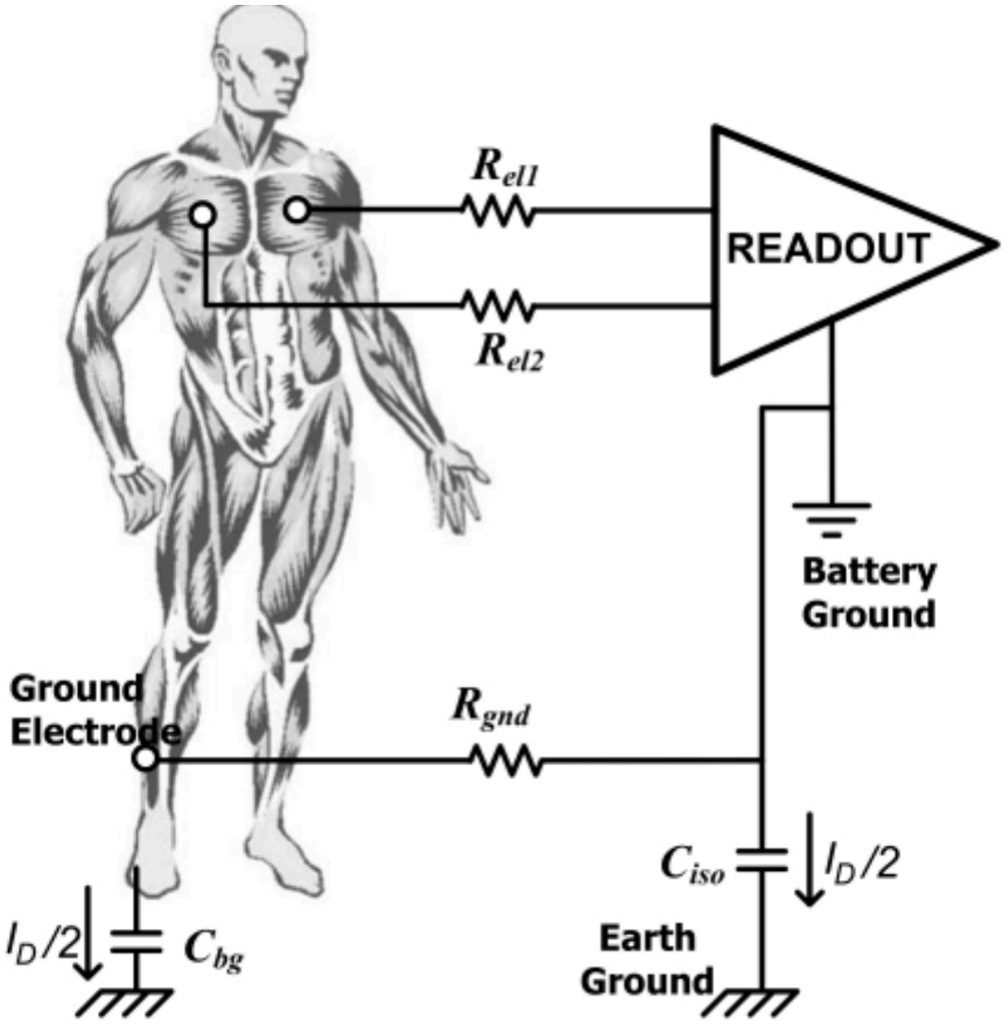
- A system is an entity that interests with one or more signals, thereby yielding new signals

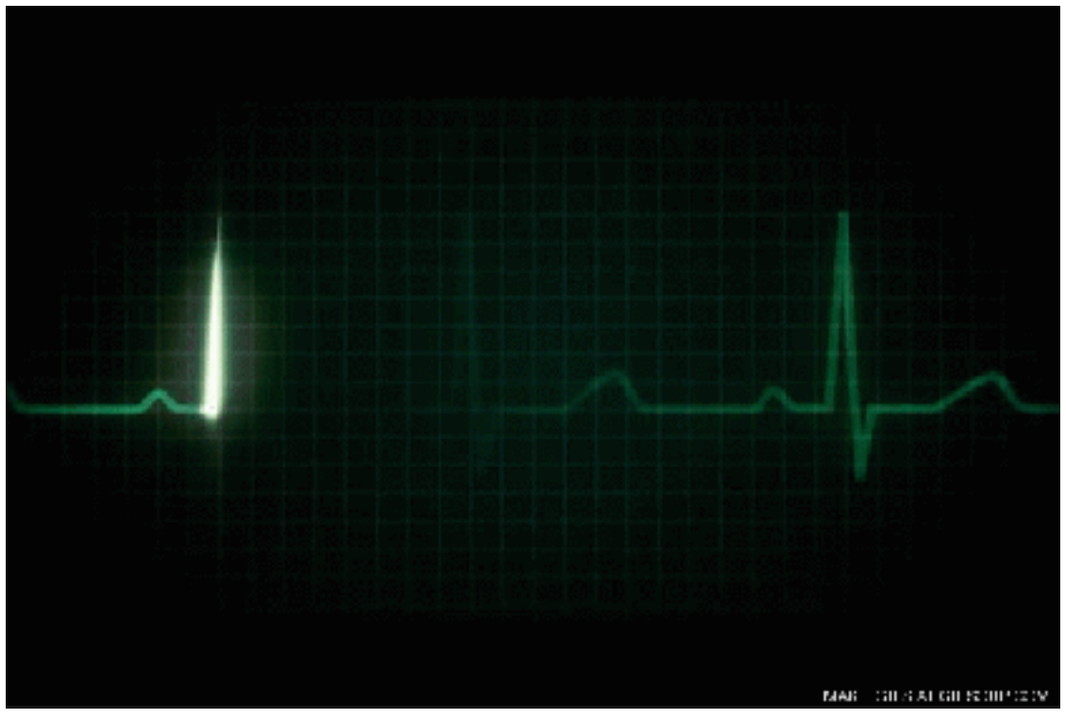

Sinoatrial Node
Atrial Muscle
Atrioventricular Node
Bundle of His
Bundle branches
His-Purkinje Fibres
Ventricular Muscle
Pacemaker potential
Progression of cardiac impulse


$\vec{p}_2$
$\vec{v} = \sum \text{projections}$
$\vec{p}_1$

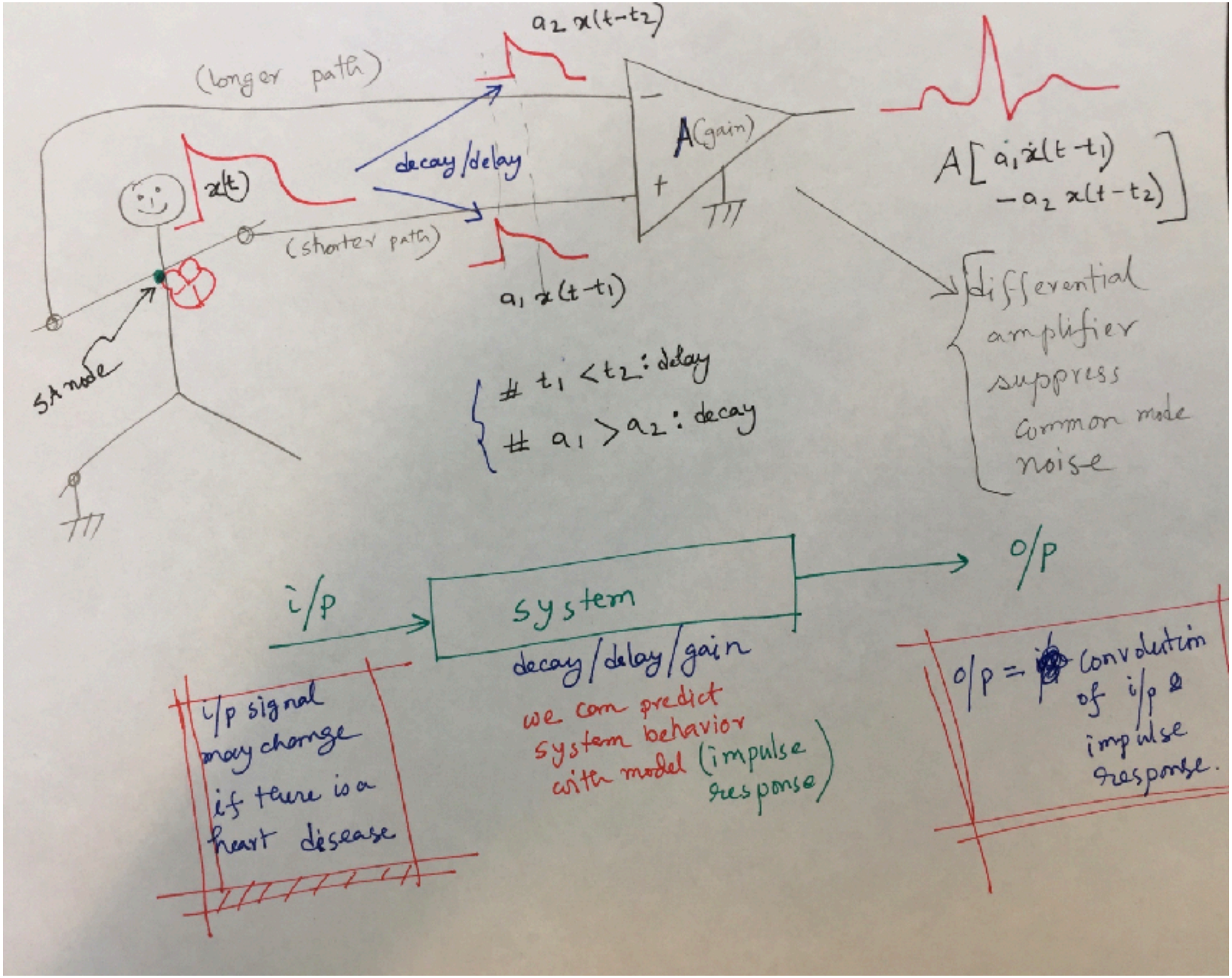




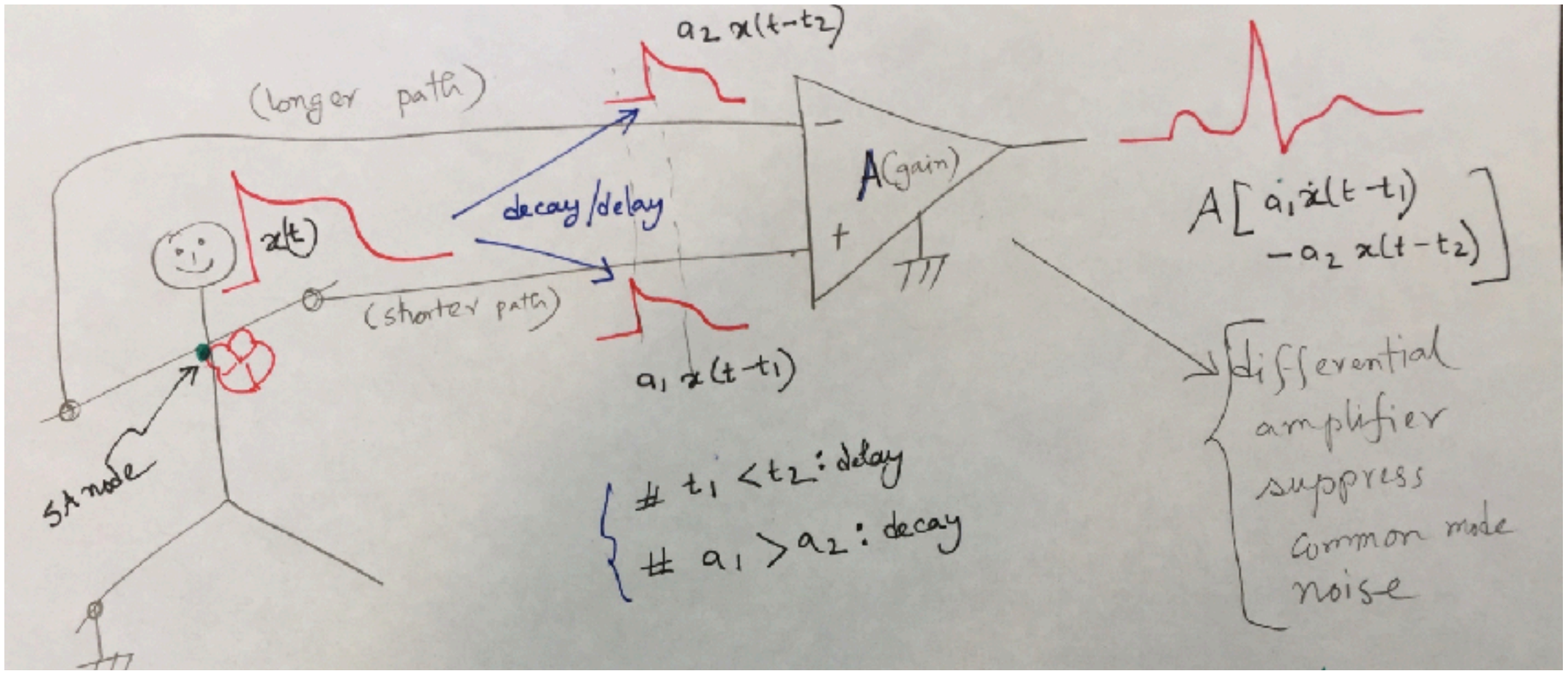




EKG/ ECG signal

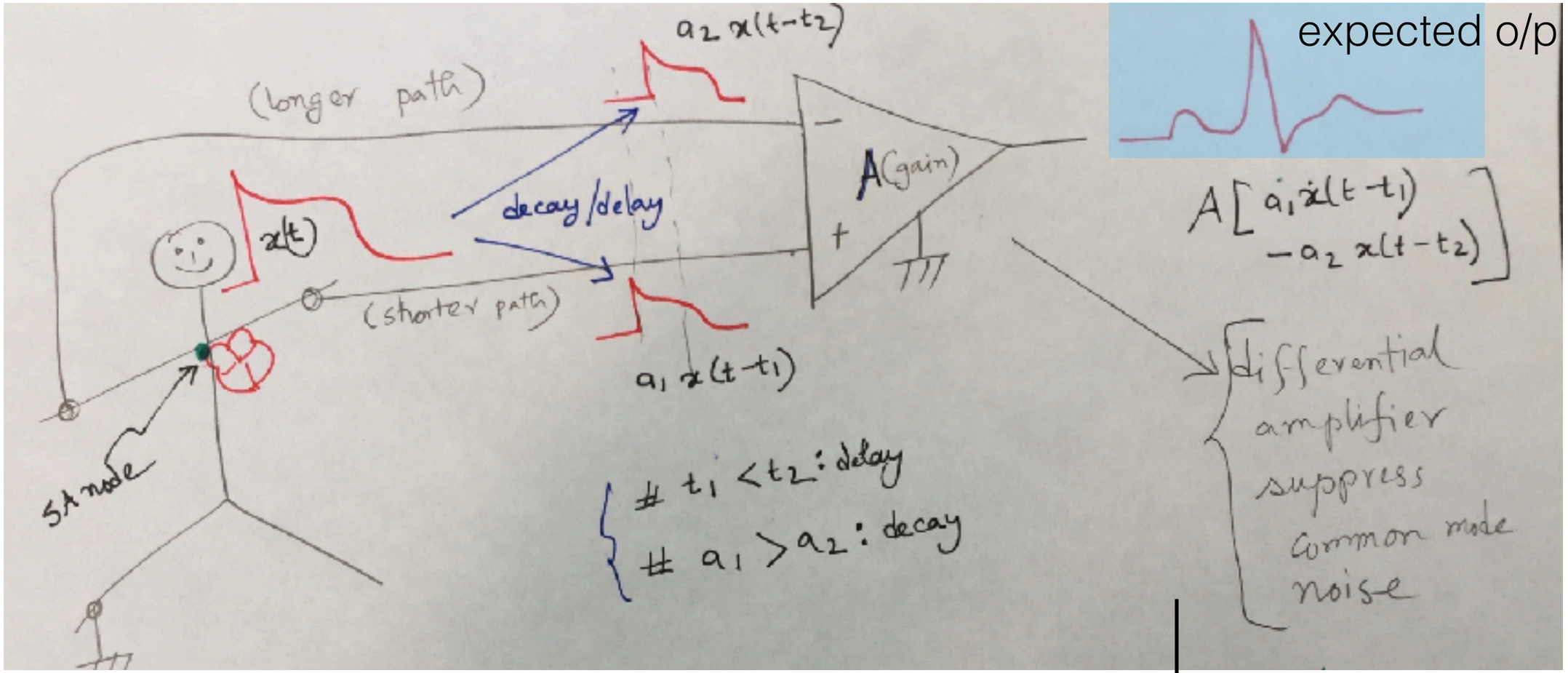

(longer path)
(shorter path)
decay/delay
A(gain)
differential amplifier
suppress common mode noise
SA node
$t_1 < t_2$: delay
$a_1 > a_2$: decay
i/p
system
decay/delay/gain
we can predict system behavior with model (impulse response)
o/p
i/p signal may change if there is a heart disease
o/p = convolution of i/p & impulse response.

Signals and Systems

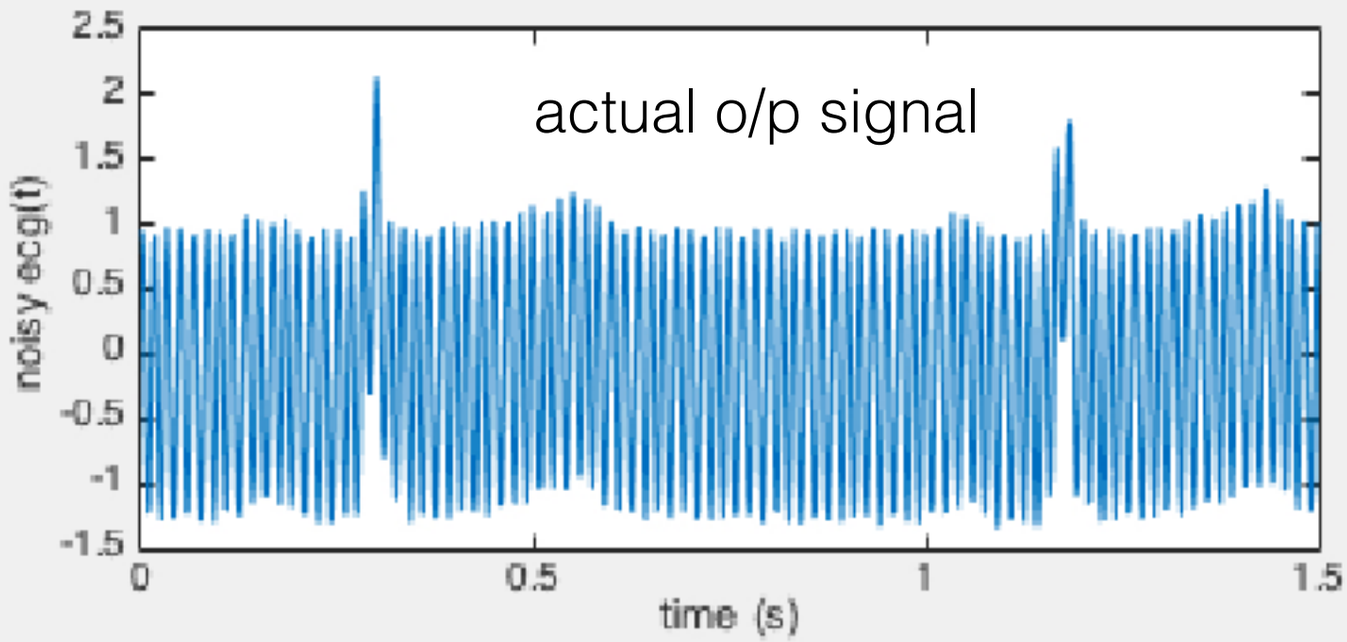


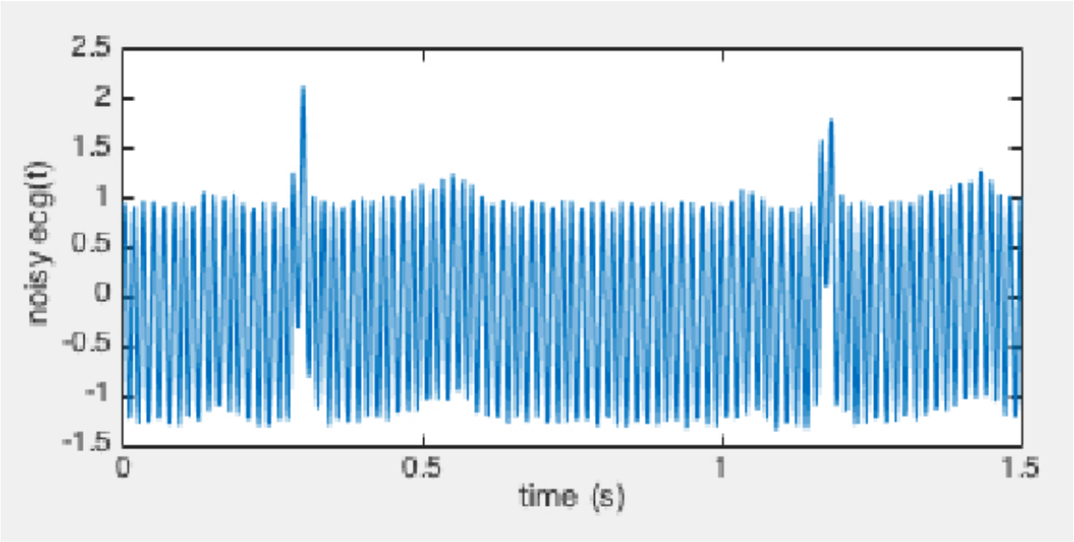
- signal time shift
- signal magnitude scaling
- signal superposition
- system model: impulse response
- o/p signal=convolution (i/p signal, impulse response)

differential equation—>impulse response



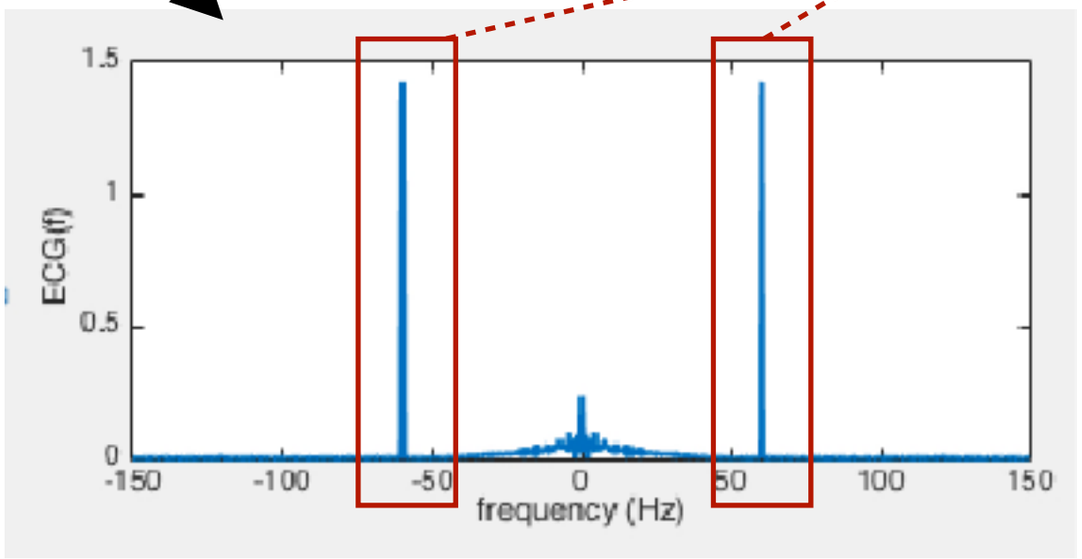
expected o/p signal





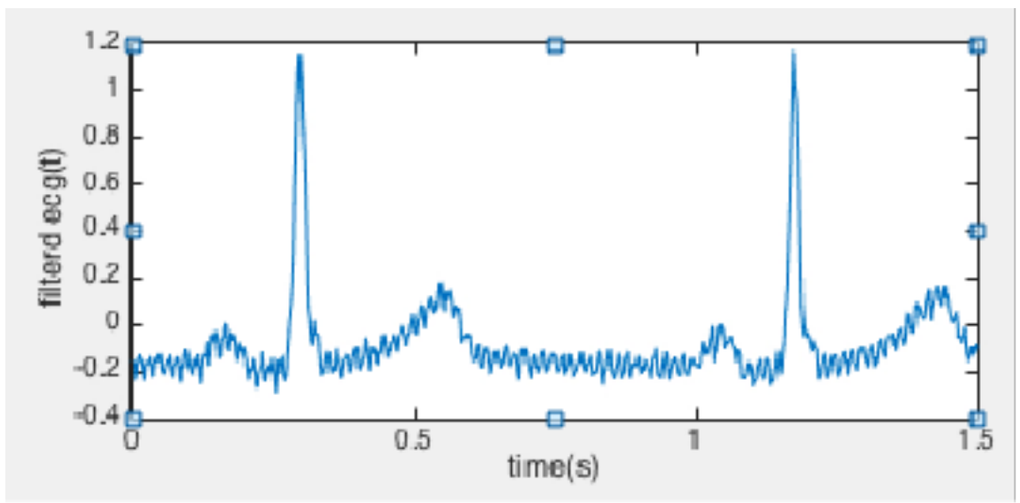
Fourier analysis

60 Hz power line noise



Noise filtering

clean ECG signal



Signals and Systems

- signal time shift
- signal magnitude scaling
- signal superposition
- system model: impulse response
- o/p signal=convolution (i/p signal, impulse response)

differential equation—>impulse response

- Fourier analysis:
  - Fourier series
  - Fourier transformation
  - Laplace transformation
  - Filter design