May 2020

OfficeHours_IS31_20160414_Seg05.pdf

Setting: mild classroom
Participants: I1 (glasses, female), IS31 (black vest) I2 (behind camera, female)

0:00
XXX: I1: ok
XXX so
XXX since you're
XXX uh mentioning↑ (.) about applying- (.)
XXX since you're mentioning applying your field
XXX to things
XXX like
XXX airplanes↑
XXX and like
XXX testing against wind but then you're also mentioning
XXX like equation stuff,
XXX IS31: [ah
XXX I1: [like
XXX uh
XXX what type of knowledge goes into your field?
XXX so like (.1)
XXX so you said it's engineering,
XXX it's- you-doesn't engineering (.1) PhD?
XXX IS31: uh:
XXX I1: or-
XXX IS31: you mean
XXX [AMS it's AMS,
XXX IS31: [uh I am
XXX yea AMS
XXX um (.) uh:
XXX yea
XXX maybe,
XXX in the mechanical engineering department
XXX they also (.) do some (.1) similar research
XXX and: the:
XXX necessary knowledge may be (.)
XXX you should be familiar with (.1) uh
XXX partial differential equations and uh (.)
XXX something about computer science
XXX I1: ok
XXX computer science
XXX IS31: [yea because you: we- we- we need to program in computer
XXX I1: [mechanical engineering (.)

XXX [ok
XXX IS31: [and we need to understand how (.) this program
EXC uh
EXC scute
EXC uh
EXC executes°
XXX ((nods)) yea
XXX I1: ok
XXX so you guys are (.) applied math (.1)
XXX just regular math↑
XXX do you need to know like regular (.1)
XXX IS31: [uh
XXX I1: [theoretical (.) [math too?
XXX IS31: [yea theoretical math are:
EXC uh: (.1)
EXC learning about theory ((laughs))
EXC uh actually
EXC uh: the
EXC the
EXC the name applied math
EXC uh
EXC uh: they are: (.2) mainly
EXC uh
EXC the main mean- the main (.1)
XXX range of applied math is only about (.) how to solve
partial
XXX differential equations
XXX I1: ((leans back)) ((mouths oh))
XXX th-th-though we call them applied mathematics
EXC but
EXC the
EXC the (.1) uh:
EXC I mean
XXX a-at least (.) in many universities
XXX in applied math (.) department
EXC the professors (.1) uh main task (.) a-
EXC or main research a-
EXC uh (.1)
EXC uh error is about (.1) solving
XXX partial differential equations°
XXX I1: oh::=
XXX IS31: =yea
XXX uh various (.) kinds of (.) partial differential equations
XXX I1: really,
XXX IS31: yea though in Stony Brook↑

XXX uh there are many other: (.1) aspects (.) in: (.) in this
XXX department
XXX but (.)
XXX uh
XXX typically (.)
XXX applied math just mean (.) solving partial differential
XXX equations ((chuckling))
XXX yea=
XXX I1: =I didn't know that
XXX I feel educated
XXX ok
XXX I almost minored in AMS
XXX now (.) I'm kind of ((incomprehensible))
XXX I2: I-I have a really:
XXX really naive question
XXX why is partial differential equations that important?
XXX IS31: oh ok
XXX I1: ((laughs))
XXX I2: you're going to laugh at my question ((chuckling))
XXX IS31: no no
EXC uh: (.1)
EXC uh
EXC because, (.1)
EXC um
XXX almost all (.1)
XXX I mean like physical roles are (.) uh (an inherent) roles
XXX they are always (pressed) in partial differential equations
XXX because
XXX uh:
XXX the- the simple equations are t-
XXX because we- we need to (.1) study the change
XXX ((I1 slightly nods))
XXX for example like the change of water↑
3:00
XXX and the- I m-I mean no- not (.) the change of temperature,
XXX I1: mhm
EXC IS31: or the change of (.)
EXC uh:
EXC your: (.) velocity↑ [(.) or so on
XXX I1: [mhm
XXX IS31: uh
XXX and uh
XXX if you- (.1)
XXX I think if you have learned calculus you should know that
XXX the derivatives (.)

XXX just mean: the changing rate
XXX I1: yea [yea yea
XXX IS31: [right,
XXX yea
XXX I1: yea=
XXX IS31: =so
XXX that's why: almost all roles (.) will involve (.)
XXX derivatives
XXX and uh (.1)
XXX once there are more than one variable
XXX it will become partial derivatives
XXX so that's why (.1) almost all programs are related by some
XXX (.) partial differential equations
XXX I1: what makes this different from like physics?
XXX IS31: u:m
XXX the:
XXX ph- physics they are:
XXX they just want to: get (.) the (.1)
XXX like such roles
XXX like such (.) differential equations
XXX but they don't care much about how to solve them
EXA they think oh that's a task for (.) mathematicans ((does
not XXX pronounce it "mathematician"))
XXX I1: oh
XXX IS31: yea ((laughs))
XXX I1: oh
XXX ok
XXX ((both laugh))
XXX IS31: ah
XXX I1: ((mouths oh))
XXX ok=
XXX IS31: =uh maybe the:
XXX in the beginning
XXX I mean like uh
XXX uh:
XXX three or four hundred years ago
XXX uh
XXX the science (.)
XXX is not (.)
XXX well uh developed
XXX and one person can (.)
XXX do: physics and math
XXX uh: simultaneously
XXX but now as there are so: much knowledge
XXX um

XXX so everyone (.1) n- nobody can learn (.) s- all the (.)
XXX aspects°
XXX so they should (.) all have their own (.) objects
XXX so for physics they (.)
XXX their main: objective is to discover (.) new (.)
XXX things
XXX new rules
XXX but (.) they are not very:
XXX um
XXX focused on (.1) how to solve such equations
XXX I1: ((mouths oh))
XXX IS31: yea.
XXX I2: huh
XXX I1: wow
XXX I2: I have a crazy question I'm gonna ask
XXX ok
XXX so
XXX if you say partial differential equations take into
XXX account very many different variables↑
XXX and (.) it's meant to: (.) account for change
XXX IS31: mm ((affirmative))
XXX I2: right,
XXX IS31: ((mouths yea))
XXX I2: now can (.) can these sort of equations (.)
XXX uh solve social science problems
XXX let's say we are now facing the presidential election
XXX I1: ((nods)) mhm
XXX I2: right?
XXX there are so many variables
XXX we don't know who is going to win
XXX I'm afraid some peo- you know
XXX I'm scared of some of the candidates
XXX but (.1)
XXX so
XXX uh
XXX let's say we know all the variables
XXX we know the voters' socioeconomic background↑
XXX their voting history:↑
XXX their-
XXX you know there's some variables
XXX is (.1) can AMS (.) help us (.) predict↑
XXX for example what the (.) election outcome might be? (.1)
XXX Krystal [does that sound like a fair question?
XXX I1: [oh
XXX uh maybe?

XXX [is it-it sounds kind of di-
XXX IS31: [I-I- (.) I understand
XXX uh s- ((looks to I2 then to I1))
XXX so yea
XXX ok
XXX so:
XXX yea I know-
XXX uh first uh
XXX there is a trend that the
6:00
XXX social science↓ want to use
XXX (quantitative matter)
XXX in their own (.) aspects
XXX but (.)
XXX um
XXX actually
XXX though many people think that math is (.) difficult
XXX ((I1 nods))
XXX uh compared to many other: (.)
XXX uh:
XXX I mean subjects
XXX but actually in social science↓
XXX the questions are:
XXX why (.) social science don't (.1) use many quantitative
XXX matters now is that (.1) the programs in social science are
XXX too: (.) difficult
XXX ((I1 nods))
XXX to deal with
XXX because
XXX for (.) example like in: physics
XXX I1: ((nods))
XXX IS31: a function only depend on:
XXX uh we say many
XXX that is just mean more than one
XXX I1: [yea
XXX IS31: [but
XXX actually it's not very many
XXX just uh like three,
XXX or two,
XXX I1: mhm
XXX IS31: or four
XXX like so on
XXX but (.) as professor mentioned
XXX ((motions to behind I2))
XXX in social science there are many: (.) too many (.1)

XXX variables
XXX uh
XXX maybe bi- millions↑
XXX or like so on
XXX and we don’t know the (.1)
XXX uh
XXX accurate (.) relation between the- the
XXX I1: ok ((nods))
XXX IS31: for example
XXX I2: ((understanding)) mm
XXX IS31: uh in physics
XXX uh:
XXX the: (.1) the force between two objects
XXX they can be:
EXA ((incomprehensible)) by their mass↑ (.)
XXX and [their distance
XXX I1: [yea yea yea ok
XXX I learned about that=
XXX IS31: =but
EXC now (.1) in social science (.)
EXC we (.) don’t know (.) what the (.)
EXC like
EXC what your:
EXC uh vote decision are (.1)
EXC uh determined by like your:
XXX education↑ (.) or your: income or so on
EXC w-we can’t (.1) uh get the:
XXX actual accurate relation
XXX I1: ok
XXX IS31: so we
XXX there is no (pd) so
XXX how to solve ((laughs))
XXX yea
XXX I2: m:
XXX I1: oh yea
XXX that makes sense because it can be like
XXX oh yea
XXX you seem like a person from this background
XXX so you’re gonna vote for this person but really
XXX they had like a friend
XXX or something else [affected them but that just changes
XXX IS31: [yea yea
XXX I1: everything=
XXX IS31: =yea
XXX so

XXX so the social science are (.) something that
XXX really really very (.) sophisticated
XXX much more sophisticated than natural science
XXX I1: ok
XXX so because the variables aren't so
XXX like
XXX well defined,
XXX they're not like discrete variables,
XXX it's hard to (.)
XXX it would be hard to predict (.1) what people (.) are doing,
XXX is that- was- is that what you were saying?
XXX IS31: yea and I: and uh (.) what I want to (.) emphasize is that
XXX we don't know (.) the (.1) accurate function now
XXX I1: ok
XXX IS31: yea
XXX I1: that makes sense
XXX IS31: yea
XXX I1: ok
XXX IS31: and uh
XXX yes, (.) there are some (.)
XXX now there are some maybe (.)
XXX maybe used for (.) (manners) to predict
XXX uh th-that's based not on partial differential equations
XXX they are just based on
XXX uh: statistical matters
EXC that is we just uh:
EXC uh (.) give some probability
XXX I1: ((nods))
XXX [ok
XXX IS31: [but
XXX you know
XXX uh (.) pd is (.) the- the
XXX the idea of pd are that everything in the future↓
XXX are: determined by it's present (.1) uh conditions
9:00
XXX I1: [ok
XXX I2: [what's- what's PDE?
XXX IS31: uh [partial differential equation
XXX I1: [((mouths/quietly says)) partial differential
XXX equation
XXX I2: oh
XXX I1: ok
XXX I2: sorry
XXX I1: [I heard it I was like
EXC IS31: [a- a- a- and and: the:

EXC and the:
EXC and uh: statistical matter are: based on
EXC uh
XXX a different (.) idea
XXX that is we (.) can't (.) predict accurate (.) future
XXX (.) conditions
XXX we just g- give some
XXX maybe most likely (.) result
XXX yea
XXX maybe that's more useful in social science
XXX I'm not sure
XXX I1: oh ok